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Companies of All Sizes Have Their Ups and Downs

Big car manufacturers subject to slumps as well as the small ones. Truth of this emphasized again by figures for 1927 first-quarter output.

By Norman G. Shidle

THE strenuous competition which has been going on in the automobile industry in recent years exhibits much more of a churning action than most casual commentators have been wont to realize. So oft repeated and so widespread has become the general statement that "in the automobile business the strong companies are getting stronger and the weak ones weaker" that a vast amount of loose thinking has resulted on the part of those too busy to dig into detailed facts for themselves.

Individual records of companies over a period of years and trends in the industry as a whole indicate clearly that individual makers have gone up and down both in production and profits, regardless of size, depending largely on the efficiency of their marketing methods, the merit of their products for the year and the intensity and intelligence of their general marketing effort. The individual production results in the first quarter of 1927 simply serve to bear out further this picture of automotive competition as a churning process rather than as a definite, straightaway trend in which some always go up and others always go down.

Weak companies undoubtedly will continue to pass out of the picture in the future as they have in the past, but it becomes more evident every time a new set of production and sales figures are made by another quarter's operations that weak does not necessarily mean small nor big necessar-

ily mean strong. Fresh evidence continues to pour in to back up the statement that the success of the large producer as well as that of the small ones rests fundamentally on efficiency of operation and ability to sense and meet the public taste.

Every executive in the industry, without stopping to think, can name over a number of automobile companies whose death knell once was sounded, but which were brought back, not only to life, but to a great fullness of prosperity by the magic touch of new designs, new management, new capital, perhaps, or new spirit. The business structure built by Walter P. Chrysler during the last few years has had in it many elements of a Phoenix rising from the ashes of a none too successful predecessor; the Oakland-Pontiac achievement under A. R. Glancy has resulted certainly

as much from the efficiency of the Oakland organization itself as from the fact that this company is associated with General Motors Corp.; Stutz and Auburn furnish other examples of somewhat the same sort of happening.

The list of current automotive successes quite obviously includes the names of large as well as small organizations. The same thing holds true of the companies which at the present time are having difficulties in holding positions which once seemed so well consolidated as to be well nigh impregnable. The first quarter figures show Ford's slippage to be continuing with ever-increasing acceleration, while one or two

THE chief lesson to be learned from automotive events of the past year or two probably is that keenness of competition apparently means that no company or group of companies can get so strong a hold on the market as to permit themselves to rest on their oars even temporarily.

"The continued success of certain companies over a period of years without the interspersions of individual 'bad years' has been due in almost every case to an organization continually on its toes, a product everlastingly kept at least up to date in fundamentals and slightly ahead in appearance, and a handling of dealer organizations on the basis of a sound and reasonably continuous policy year after year."

other prominent company names as well as several small organizations must be included in the roster of those who have fallen far below their first quarter achievements in 1926 and even below their own 1925 levels.

Several more large organizations, after a somewhat unfavorable showing in 1926, have revamped their lines, struck spurs to their sales organizations and are engaged in regaining ground lost last year and in trying to entrench themselves in new forward positions before the end of 1927. Real progress is being made by several companies in this regard, although one or two others are having a harder time realizing their ambitions. Again, however, large as well as small companies are included in the roll.

The Causes of Failures

Failures, as a matter of fact, are often as interesting to analyze as successes. The results of such contemplation so far as the automotive industry is concerned may well bring smiles as well as tears because, while no one can rejoice in failures, study of why many small automobile companies have passed out of the picture reveals the fact that a goodly proportion of them have "gone West" as the result of actions which would have resulted in failure just as severe and just as certain had their size been twice or fifty fold what it was.

The chief lesson to be learned from automotive events of the past year or two probably is that keenness of competition apparently means that no company or group of companies can get so strong a hold on the market as to permit themselves to rest on their oars even temporarily. The continued success of certain companies over a period of years without the interspersal of individual "bad years" has been due in almost every case to an organization continually on its toes, a product everlastingly kept at least up to date in fundamentals and slightly ahead in appearance, and a handling of dealer organizations on the basis of a sound and reasonably continuous policy year after year.

Competition is responsible for a churning action in the industry, for the wafting to the top of the heap one company this year and another next. It is not resulting primarily in pushing certain companies ever upward and certain other ones ever downward as so many casual observers seem to think has been the case.

All Companies Facing Problems

Every company in the automotive industry, large or small, is faced today with several problems of prime importance. The necessity for greater profit per unit and the difficulty of achieving any such end probably is the most vital one, as has been pointed out frequently in recent weeks. Fortunately the tendency to overbuild, which seemed to have possessed so many companies a few years back, apparently has abated materially, a number of firms having refrained from increasing their plants last year despite consistently good sales.

Among certain car manufacturers, of course, there still seems to exist a somewhat overly optimistic idea of how many cars their organizations may reasonably expect to sell, but the added brick and mortar overhead expense of the industry was less during the last twelve months than for some time past. Much of the increased capacity recorded during 1926 has resulted from the installation of better and more economical

equipment or from the improvement of detailed methods in many ways.

Few of the factories which increased their production facilities materially last year have thus far recorded sales increases commensurate with their capacity increases. One company, for example, which increased its production capacity more than 200 per cent during 1926, built in the first quarter this year less than one per cent more cars than in the first quarter last year; another whose capacity increase was 20 per cent, didn't come up to its 1926 first quarter; still another whose capacity advance was 25 per cent, just barely equalled its 1926 first quarter. In one or two instances, to be sure, actual production increase did come somewhere near the capacity increase made last year, but such cases are the exception rather than the rule.

Nevertheless, the over-capacity bugaboo isn't frightening a majority of makers seriously. No industry, it is pointed out, can hope to run to capacity for more than brief periods and any industry running at 60 per cent of capacity as a regular thing is not in particularly bad shape, especially when a large proportion of the companies in that industry can record good profits under these conditions. Automotive companies, while profit margins have been narrowing, still are making good returns in most instances and the industry seems likely to run at something over 60 per cent of capacity for the year 1927.

Not Sole Gage of Prosperity

Per cent of capacity operation, moreover, is not the sole gage of prosperity by any means. An interesting commentary on this appears in a recent bulletin of the National Bank of Commerce which says:

"Last year the steel industry ran at about 85 per cent of capacity, wool textiles around 70 per cent, paper at over 80 per cent, rubber fabricators about 80 per cent and cotton textiles at 95 per cent of rated capacity.

"Serious as the capacity situation appears, the automotive industry as a whole is one of the most profitable in the country. It has been estimated that the steel industry has earned barely 5 per cent of its capital investment in recent years. A number of other important industries, while operating at a higher rate than the automotive, have not made exceptional earnings. For several years past the automotive industry has been foremost among all industries of comparable size in earning capacity."

And incidentally, while the automotive industry has been developing a large number of moderate sized companies with relatively good earning power over a period of years, its general prosperity is typified by its development of two of the ten billion-dollar corporations which now exist in the United States. General Motors Corp. and the Ford Motor Co. stand as examples of automotive prosperity in this exclusive circle of billion-dollar companies which includes the U. S. Steel Corp., the American Telephone & Telegraph Co., the Standard Oil Co. of N. J., and five big railroads.

The competitive era in which the automotive industry now finds itself is in many respects the most stabilized period since its inception. Under conditions now existing sound methods, proper design, adequate service and intelligent marketing are playing a greater part in determining ultimate success than at any past time. As these elements grow in importance, it is entirely probable that the automotive industry will steadily become better balanced and safer.

New Gearless Differential Invented by Russian Engineer

Drives through inner wheel only when describing curves. Low cost of production cited as advantage. Has been adopted for cars built by the Skoda Works at Czechoslovakia.

By P. M. Heldt

A NEW gearless differential of the type which drives through the inner wheel only when describing curves has been invented by a Russian engineer, Abramson. It has been extensively tried out by the Skoda Works of Czechoslovakia and is reported to have been adopted by this concern for use on the cars manufactured by it. Among the advantages claimed for it by the inventor is that it is cheaper to manufacture than the conventional differential. The American interests of the inventor are being looked after by Adolph Moses, Mount Vernon, N. Y.

One design of the differential is shown in plan and cross section in Fig. 1. It comprises two pawls 6, 6' with a common pivot 9, which are pressed by the springs 7, 7' against the balls 8, 8'. The two-part pawl 6 is pressed by spring 7 against the ball 8'; both of its parts are fastened to stud 9, and it locks the stop 4 and shaft 5. The second, simple pawl 6' is pressed by spring 7' against ball 8 and the stop 4' and mounted free on stud 9.

When the car is being driven in a straight course the pawls 6 and 6' are raised. If now one of the road wheels begins to run ahead in the right-hand or clockwise direction, the pressure of spring 7 on pawl 6 presses the ball 8' and the adjacent pawl 6 down, whereby stop 4 and shaft 5 together with the corresponding road wheel are positively locked to the driving stud 3.

With this construction the two sides of the differential mutually lock each other when one runs ahead on a curve, but the freedom of motion of the two wheels is not

closely limited during straight ahead motion. This object is accomplished in another design, illustrated in Fig. 2. Such limitation of the freedom of motion for straight ahead drive is necessary in order to avoid shocks within the differential when reversing, etc.

The automatic mutual locking device in this case consists of the bar 6 passing diametrically through the differential casing 2, and of the steel ball 7. The steel

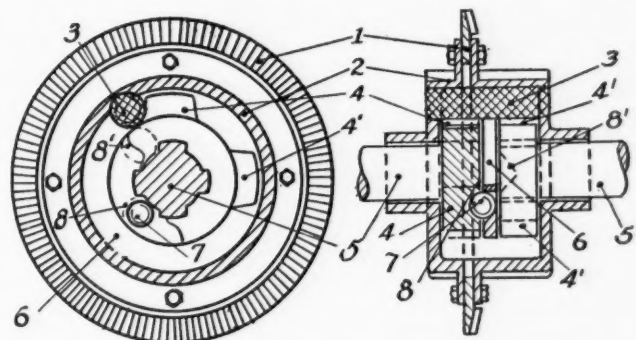


Fig. 2. Abramson differential without backlash in straight-ahead position

ball is located in a hole in bar 6 in such a manner that it can shift in a direction parallel to the rear axle. When the ball is in the central position it extends slightly into both of the conical depressions of the hubs carried on the inner ends of the two rear axle shafts. This occurs only when the two depressions are directly opposite each other; that is, when the two stops 4, 4' are in contact with the driving stud.

If one of the road wheels runs ahead of the other, in describing a curve, as indicated in the drawing for shaft 5' the plane side face of the hub 4' presses the locking ball 7 into the depression 8 of the opposite hub 4, whereby stop 4, shaft 5 and its road wheel—the inner wheel when driving around a curve—are positively locked to the driving stud 3 by means of the ball 7 and bar 6. This construction therefore insures not only the automatic locking of one side of the differential to the driving member when the other side runs ahead, by this latter side, but also assures that there is but little backlash in the differential when in the straight-ahead position.

After continued use of the design shown in Fig. 2 it was found that grooves were worn by the balls on the sides of the hubs 4, 4', which showed that this type of differential was suitable for light cars only. For cars

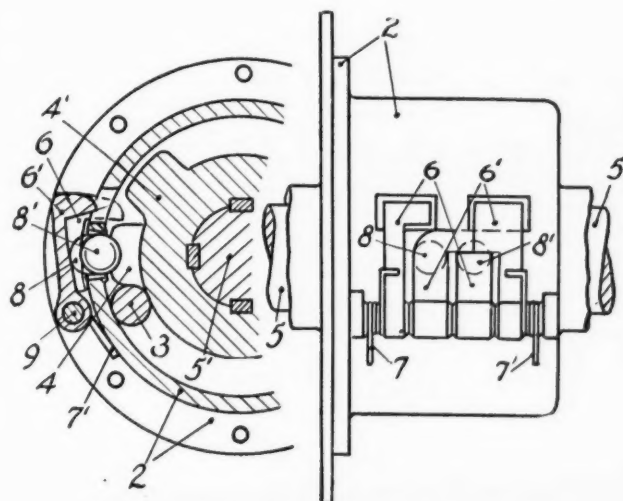


Fig. 1. Abramson differential for light cars

of larger size the type shown in Fig. 3 was developed, in which this difficulty was overcome partly by using balls of larger diameter and partly by shaping the hubs like the races of ball type thrust bearings, that is, with ball race grooves on their faces.

For very large passenger cars and for trucks the design Fig. 4 is recommended. In this the driving stud 3

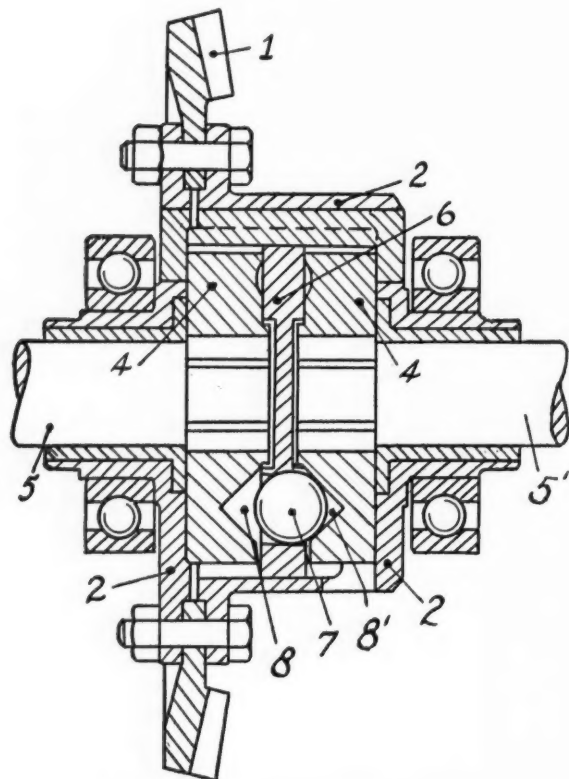


Fig. 3. Differential for large cars, with large locking ball and ball grooves turned in faces of differential hubs

is prevented from falling out of the housing by means of the plate 3'. The automatic and mutually active lock in this case consists of the radially arranged latch bolt 6 which can be turned around its axis by the pressure

of spring 8 and the stops 4, 4'. The bolt turns inside the boss 2' of the differential housing and consists of three separate parts. The upper end is enlarged in diameter and made hollow to receive the spring 8, while a right-angled section is cut out of the upper edge to permit of fastening the spring ends, as shown in the sub-figures. Its central portion is a solid cylinder, while of the lower section one-half is cut away, this section engaging into corresponding openings of the stop 4, 4'. The locking bolt is prevented from falling out of the boss 2' by the cover plate 7 held in place by screws. This plate carries on its inner side an eccentrically located pin 7' serving as anchorage for the spring 8.

The operation of this latch bolt is shown diagrammatically in the sketches *aa'* and *bb'*. The normal position of the latch bolt 6, when there is no differential action, is shown in sketches *a* and *a'*. The lower, cut-away portion of the bolt in this position is turned by the pressure of spring 8 (6 to 10 lb.) so that it freely locks the driving elements, the two stops 4, 4' and the driving stud 3, thus assuring simultaneous and uniform drive of the two sides of the differential, up to the point where the maximum permissible power overcomes the spring pressure.

When a curve is started upon and shaft 5, for instance, is to run ahead, the excess pressure due to the greater traction resistance overcomes the pressure of spring 8, and through the stop 4 turns the latch bolt 6, 6', 6'' to the position indicated by *b*, *b'*, in which stop 4 is released while stop 4' is positively locked to the driving stud 3 by parts 6, 6', 2', 2. The simultaneous functions of spring 8 are illustrated in sketches *a'* and *b'*.

When the engine is declutched it is impossible for the stops 4, 4' to be carried out of their forward position by the momentum of the car, hence there is no possibility of shocks, as these parts secured in their forward positions by the latch bolt 6, by means of the differential casing 2, 2' not shown in the drawing. While driving backward it is impossible for the driving stud 3 to pass from the rearward to the forward position, hence there will be no shocks in this case either, because stud 3 in this case is locked with stops 4, 4' by means of the latch bolt 6. The driving torque is then transmitted from the housing 2, 2' to the stops 4, 4' not through the driving stud 3 as in sketch *b*, but through the latch bolt 6.

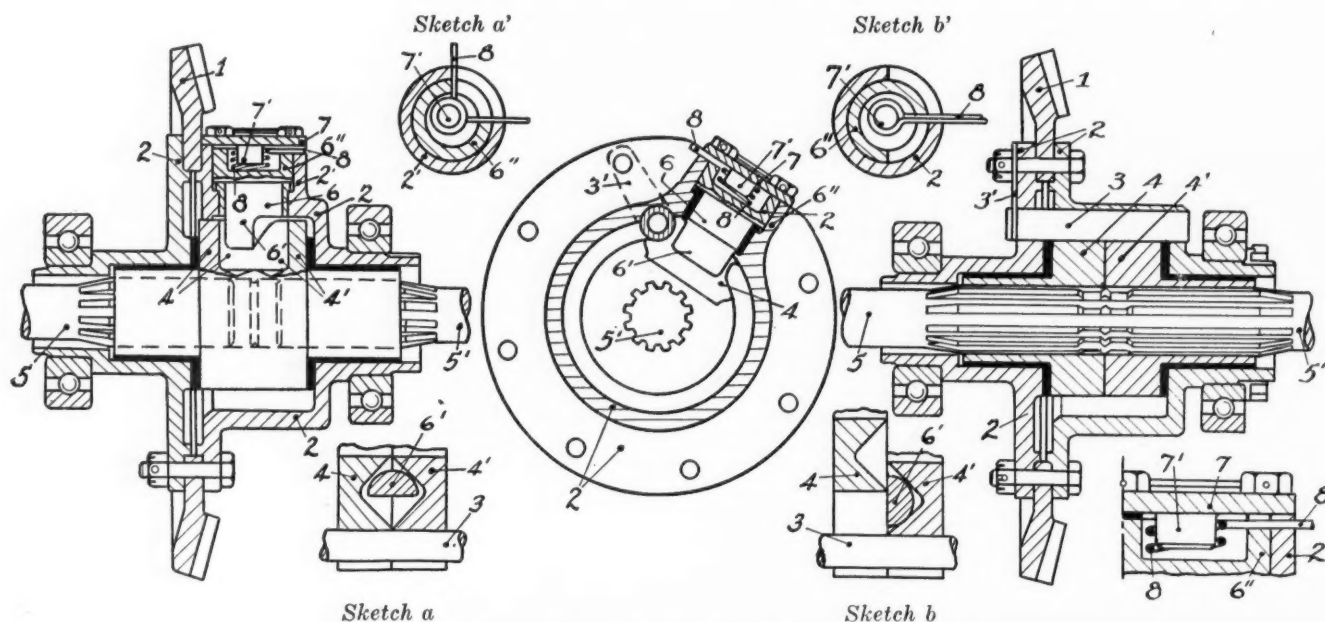
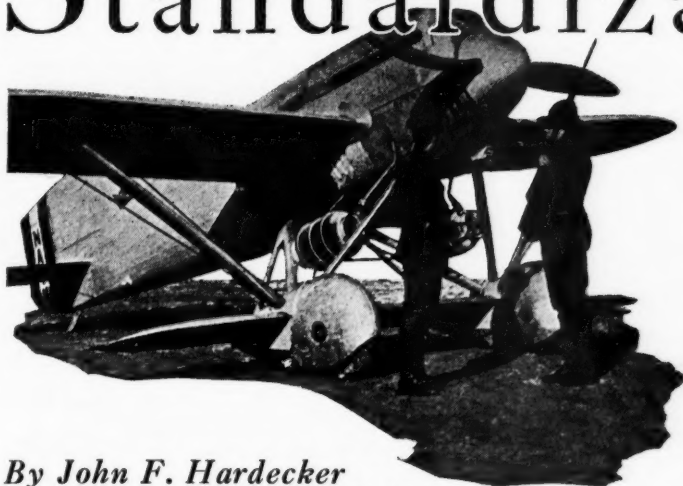


Fig. 4. Abramson differential for trucks

Standardization *in* the Air



By John F. Hardecker

Naval Aircraft Factory, Philadelphia, Pa.

Rapid progress is made by aircraft industry in standards work since the chaotic days of 1918. S. A. E. largely instrumental in starting movement.

THERE probably never has been a field of mechanical endeavor better suited for standardization, or simplification, as Secretary Hoover prefers to call it, than aeronautics.

An infant development, fostered through the stress of war at an unprecedented rate, the situation confronting the industry at the end of the war-time period can only be described as chaotic. True, each manufacturer and the Government services did have some standardization within their own respective organizations, but the efforts were uncorrelated and spasmodic. The stock required to be kept in stores by each manufacturing agency was too often dependent upon the experience, previous training and preference of engineering personnel, exact analytical specification, or availability in stores, as the case might be. This often meant that the parts or materials would not be available in stores, or purchaseable, when shop work was undertaken.

Gradually each aircraft manufacturing agency undertook more extensive standardization, and while from a broad, practical viewpoint the results were only locally valuable, they provided the background and experience upon which in time standardization must be founded. It developed within each organization individuals who were acquainted intimately with standardization problems and who were men of vision.

The Society of Automotive Engineers in the meantime kept the spark of universal standardization alive, although with the biggest operators of aircraft in the country—the Army and Navy—at variance in the details of their standardization activities, the opportunities of the S.A.E. were limited. Then too, the policy of creating only interchangeability (dimensional) standards for parts without linking up with the part a specific material, further limited the opportunities. But the Society did supply the all-important nucleus of a tie between the various agencies engaged in standardization work.

So, when the Army and Navy joined in inviting the aircraft manufacturers and the Society of Automotive Engineers to the first Army-Navy Standards Conference at the Naval Aircraft Factory, Philadelphia, Pa., in the summer of 1924, they found a waiting, willing and responsive industry. It was fortunate that the men who attended this conference were men who had

been dealing intimately with standardization problems in their own organizations. The object of the conference as briefly stated in the official report was:

“ . . . to eliminate the differences in the specifications and requirements for the standard parts of the Army Air Service and the Navy, and to adopt a uniform system of standards. This will permit the manufacturers of standard parts and the manufacturers of aircraft to carry only one set of such material, which they may use to fill both Army and Navy orders. It will also permit an interchange of parts between the two services. The conference has taken steps to cut down the number of kinds and sizes of standard parts, and to make such changes in the parts adopted as have been shown in the service to be desirable, and has endeavored at the same time to change the existing standards as little as possible.”

Materials and Parts

The conference was divided into two sessions, one to consider material specifications and the other to consider standard parts. The Specifications Section did much useful work on metal material specifications and in fact laid the groundwork for the raw material specification standardization which has proceeded so smoothly and successfully.

The Standard Parts Section adopted the Class III medium fit thread of the National Screw Thread Commission as its general standard for threaded parts. In detail, action was taken on aircraft bolts, aircraft nuts, clevis pins, cotter pins, streamline tie rods, rigid terminals, turnbuckles, thimbles, washers, hose liners and control pulleys. The very diversity of these parts established principles which have been carried out in the subsequent expansion of these types at future conferences. Considering the many subjects under discussion and the difficulties and obstacles to standardization which had grown out of years of usage, a great deal of progress was made. When decisions could not be reached, authority was given the Service best equipped for the purpose, to carry out necessary tests and investigations to be reported back to the next conference.

The procedure established for the promulgation of standards was to have drawings prepared by the Naval Aircraft Factory in accordance with the decisions of the

conference. These drawings are known as Army-Navy or AN Standards, and have a new series of numbers beginning with 1 and preceded by the letters AN; as each drawing is finished the master copy is sent first to the Chief Engineer, Army Air Service, Dayton, Ohio, and then to the Chief of the Design section, Bureau of Aeronautics, Navy Department, Washington, D. C., for their signatures. The master copy is returned to and filed at the Naval Aircraft factory. Service drawings are then prepared for use in the preparation of Standard Books. These books are circulated throughout both services and copies supplied to all commercial manufacturers of parts or aircraft. An AN Standard adopted and promulgated as above may be changed only by agreement at a subsequent conference.

The policy of establishing standards which were interchangeable with all previously existing standards together with the wise policy of permitting parts or material manufacturers to supply and fill orders for AN Standard parts or material from existing stock until that stock was exhausted, assured the success of the venture from the start.

The second Army-Navy Standards Conference held at the Engineering Division, Army Air Service, Dayton, Ohio, in 1925, brought out an increasing representation from the industry. This conference saw the first departure from the purely structural items, as powerplant items, such as fuel system fittings, hose clamps, filler caps, etc., came before the conference for its decision. It also marked the first discussion of standardization on fundamental items such as engine bearer spacing. It also considered such matters as airplane wheels, engine control units and stick control grips. A great deal of progress was made in metal material specifications.

It was also urged by the manufacturers that the assignment of a single designation or part number to standard parts would be of very great convenience to all concerned. A system was adopted whereby similar parts are grouped together for the convenience of those using the Standards Book. This arrangement was carried out by assigning blocks of numbers to the various parts, these blocks containing sufficient numbers to include present standard parts and also allow the adoption of a large number of additional parts which may be given numbers in the same series without revising the Standards Book as a whole. This number preceded by the letters AN once assigned cannot be changed except by authority of an Army-Navy conference. In the case of units made up of several detailed parts, the unit when

Some Advantages of Aircraft Standardization

1. Permits manufacture or purchase on a mass production basis, resulting in a reduced cost.
2. Concentrating on a lesser number of sizes and types encourages improvements in methods and equipment that will ultimately reduce waste and reduce cost.
3. Encourages wider competition on a standardized product.
4. Permits parts manufacturer to accumulate stocks and reduces stock necessary to be carried by the airplane manufacturer.
5. Permits parts manufacturer to stabilize his production and employment and manufacture for stock in slack periods.
6. Reduces engineering work on design, as standard parts may always be referred to by the part number.
7. Facilitates interchange of parts on airplanes manufactured by different manufacturers, reducing stock necessary to be carried by operation units.
8. Facilitates replacement and emergency repairs from nearest supply base.
9. Coordinates and simplifies all design data and permits the creation of charts, graphs, etc., to facilitate design.

adopted as an AN Standard is to receive an appropriate part number. The drawing of the AN Standard will have a note entered on it which will allow the user or manufacturer to obtain installation and construction dimensions either from other drawings of the detail parts or in an equivalent manner. Each detail part will have a part number, which, however, need not bear any relation to that of the unit adopted as an AN Standard except that the letters AN shall also precede the number designating the detail part.

The third annual Army-Navy Standards Conference was held in 1926 at the Bureau of Aeronautics, Navy Department, Washington, D. C. This conference saw the extension of many existing standards to include larger sizes to meet the growing needs of the industry, as well as the addition of more structural parts. In the

powerplant field, standards for fuel line strainers, engine control units, fuel system fittings, primers and hand fuel pumps were definitely adopted, and many other parts discussed for the first time. Many general matters such as stitching of fabric to wings, electro-plating, code marking of doped panels, etc., were brought into accord between the two services.

A sub-committee was appointed to investigate the subject of commercial hardware such as wood screws, nails, hinges, tacks, etc., with the purpose of standardizing on these so that they may be bought commercially without specifications for material. This will greatly facilitate interchangeability as well as the servicing of these parts for replacements for planes in service, and should prove of great convenience to the manufacturers of airplanes as well as the suppliers of this class of material.

The specifications division expanded its activities to include many materials outside of the metal field. Agreements were reached in specifications for radiator hose, cotton, linen and silk thread, propeller woods, plywood, spar varnish and airplane tires and tubes. In all cases where a Federal Master Specification existed for the material in question, every effort was bent to bring the aeronautical specification in accord.

This session was marked by the innovation of introducing the Aircraft Structural Design Conference for the first time. This conference took up such matters as coordination of design specifications, usefulness of a proposed airplane design handbook, the structural research work of the various Government agencies, the necessity of static-testing new types of planes and recommended limiting strength values of aircraft materials for use in design.

The adoption of specific strength values for structural materials filled a long-felt want of the designer and eliminated many points of controversy that have always existed between different schools of metallurgists and designers. These values are summarized below, all values being in pounds per square inch:

Cold Rolled Medium Carbon Steel (SAE 1025)	
55,000.....	Tensile strength
36,000.....	Yield point
90,000.....	Bearing strength (except hinges)
60,000.....	Bearing strength for hinges and where subjected to stress reversals.
55,000.....	Compression strength
35,000.....	Shearing strength.

Heat Treated Duralumin (17ST)		
Sheet	Bar	Tubing
55,000	{ 55,000 (3/4" diam. and below) 50,000 (above 3/4" diam.)	55,000 tensile str.
30,000	{ 30,000 (3/4" diam. and below) 25,000 (above 3/4" diam.)	30,000 yield point
75,000	75,000	75,000 bearing str.
{ 27,000 (abv. 1/16" thick) 20,000 (bel. 1/16" thick)	30,000	27,000 shearing str.

Chrome Molybdenum Steel Tubing (as received)	
95,000.....	Tensile strength
60,000.....	Yield point
80,000.....	Tension near welds.
50,000.....	Shear near welds.
60,000.....	Shear unwelded.
125,000.....	Bearing, near welds.
140,000.....	Bearing, unwelded.

Heat Treated Alloy Steels (Chrome Molybdenum, chrome vanadium, 3 1/2% Nickel S.A.E. 2330)			
Ultimate Tension	Yield Point	Bearing Strength	Shearing Strength
100,000	80,000	140,000	65,000
125,000	105,000	175,000	80,000
150,000	125,000	190,000	100,000
180,000	140,000	200,000	115,000

The bearing strength to be reduced to 125,000 near welds.

Besides the logical expansion of the subject matter in the fields of standardization already undertaken, many new fields still open up. In the case of airplane engines a wonderful opportunity exists.

At present each engine manufacturer develops his complete engine with his own drawings, and, in fact, in many instances makes complete drawings for each part on every model of engine. This leads, for example, to a total of over 100 part numbers for 1/16 in. cotter pins of various lengths where by the use of AN part numbers only seven would be required. And as a further example, there are now in existence 20 part numbers for a 1/16 in. cotter pin 1/2 in. long, while only one AN part number serves the same purpose. Then again when engine control rod terminal standardization was undertaken, investigation disclosed that 30 different terminals would have to be adopted to fit existing distributors, magnetos and carburetor connections on engines, while if the standardization was inaugurated on the engines themselves this could be limited to five. Engine standardization may also include engine service tools as well.

In the field of equipment much remains that can be done. While in general, if a commercial product already exists in universal use, that product is adopted for aircraft use, there are many exceptions where standardization would make it possible to design a part more particularly suitable for aircraft and which would still be purchased at a price comparable to the present commercial part. As an example, the commercial fire extinguisher bracket in general use weighs 0.7 lb., while a special design can reduce this weight to 0.2 lb. This is distinctly worth while from an aeronautical engineering viewpoint.

Although the Society of Automotive Engineers has adopted the policy of investigating the AN Standards with the purpose of promulgating them as recommended practice, it still has a great field in the standardization of parts centering about powerplants of 200 hp. or less,

a field in which the Army and Navy are not directly interested. The Society has already begun the preliminary work necessary to carrying out this program.

Then there is the field of shop processes and detailed designs. Illustrative of shop processes would be heat treatment specifications for metals, methods of finishing and plating, sewing, tools, etc. Detailed design specifications would cover such items as spacing of rivets, grain in forging, terminal lugs on fittings, etc.

Of especial interest perhaps to the Army and Navy would be ordnance standardization, radio standardization, navigation light standardization and kindred subjects. Instrument standardization would be of general application. And, so, while to the distant observer it may appear that the field has been fairly thoroughly covered, to the aeronautical standardization enthusiast we have literally but scratched the surface. Unhampered by years of precedent, it is not unreasonable to hope that aviation may in time pioneer the way in standardization activity, just as it has pioneered a new era in transportation.

Efficiency of Oil Pumps

TESTS on the power consumption and volumetric efficiency of oil pumps as used on automobile and aircraft engines have been comparatively rare and American engineers may be interested in some tests of such pumps which were made in the Mechanical Laboratory of the Breslau Technical College, the results of which were briefly summarized in the *Zeitschrift des Vereines Deutscher Ingenieure*. The tests were made on a vane type pump from a Hispano-Suiza aircraft engine and on two gear pumps from automobile engines. It was found that both the mechanical efficiency and the volumetric efficiency are dependent on the viscosity of the oil and on any leakage occurring.

The vane type of pump has two chambers and the theoretical delivery per revolution is equal to two times the maximum volume of each chamber. Maximum delivery is assured when the inlet and outlet bosses are coaxial, 180 deg. apart, and perpendicular to the axis of eccentricity of the rotary piston. The theoretical delivery per revolution of a gear pump is equal to twice the amount of oil which is pressed out of the tooth spaces of one gear by the teeth of the other. In order to determine this it is necessary to measure the volume of the tooth spaces and of the teeth, and the clearance at the bottom of the tooth spaces must also be taken into account.

It was found from the results that the volumetric efficiency of the gear pump increases with the speed, while with the eccentric or vane pump the volumetric efficiency reached a maximum value at 1500—2000 r.p.m. The reason for this difference in the characteristics of the two types is said to reside in the oil, which, by reason of its viscosity, cannot follow the rapid impulses of the vanes at the higher speeds. With the gear pump the flow is more nearly uniform and the volumetric efficiency therefore continues to improve with increase in speed.

With gear pumps the volumetric efficiency decreases with the viscosity. This also held true for the vane pump below 1000 r.p.m., while at higher speeds a maximum volumetric efficiency was obtained for oil of a viscosity of 3 deg. Engler. Noticeable heating in the pumps occurred only when high viscosity oil was pumped against considerable pressure heads.

Lands at Top of Industry Said Had



Mr. Glancy is seen here turning the first shovel of dirt for the huge new Pontiac factory which was recently completed under his administration at a cost of \$15,000,000

A. R. Glancy, president
a "business doctor"
who hits best

By Lewis

It is as an organizer that Mr. Glancy hits his best stride. He acquired his ability along this line through years of experience in the engineering and business fields, where he came to be more or less known as a "business doctor" due to his ability to step into the breach of big companies which were going bad, and, after making a study of them, decide whether they should be liquidated or continued.

He is the kind of a boss who likes to find out for himself what is going on in "the works" and during working hours at the big Oakland plant one is more liable to find him somewhere about the factory than in his own office. He also makes frequent trips into the field and has built up a strong personal following among the great family of Oakland dealers in all parts of the country.

Mr. Glancy was born in Miamisville, Ohio, July 17, 1881, and when a lad of six years moved with his parents to Washington, D. C., where he completed his public and high school education. He elected to take a mechanical engineering course at Lehigh University and after graduating secured a position with the Cleveland Cliffs Iron Co., at Ishpeming, Michigan, as assistant

master mechanic at a salary of \$50 a month. In 1905 he secured a position in Buffalo as superintendent of boilers for the Lackawanna Steel Co. The job only lasted about 60 days, however, when he went with the Sullivan Machinery Co., selling mining and

AS a college senior in 1903 he wrote a thesis to prove that the automobile had no future. When he was ready to go to work he sought an opening in other fields. He worked in an iron mine; tried his hand at selling mining and quarrying machinery; spent three and a half years in Cuba, where he took "the top off a mountain"; came back to the "States" as a construction engineer; joined a big firm that sold out to the duPonts; started to war as a major of engineers but ended up by building a munitions plant at Nashville; then woke one morning to find that in the course of events he had become manager of a tractor company owned by General Motors.

Destiny has hewn for him a circuitous path which led back eventually to the industry whose doom he had sealed in his college thesis 17 years before.

Such is the business career of A. R. Glancy, president and general manager of the Oakland Motor Car Co., who has been concerned with automobile production only seven years, but in that brief time has demonstrated that he is one of the most successful executives in the industry.

Perhaps his proudest accomplishment since he took up the executive reins at Oakland was the introduction of the Pontiac, which broke all sales records by a wide margin for an automobile in its first year, and made it possible for him to convince General Motors executives of the necessity of providing another new plant, fully as large as the original Oakland factory, to take care of the Pontiac production of the future. This new factory has just been completed at a cost of \$15,000,000.



As a senior at Lehigh in 1903 he wrote a thesis to prove that the automobile had no future

Which He Once No Future

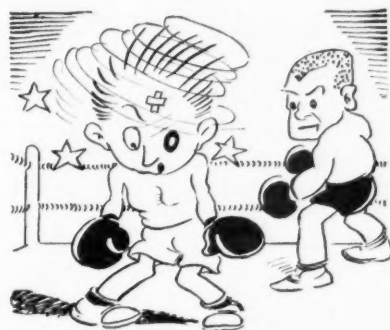
of Oakland Motor Car Co.,
of varied experience
stride as organizer.

C. Dibble

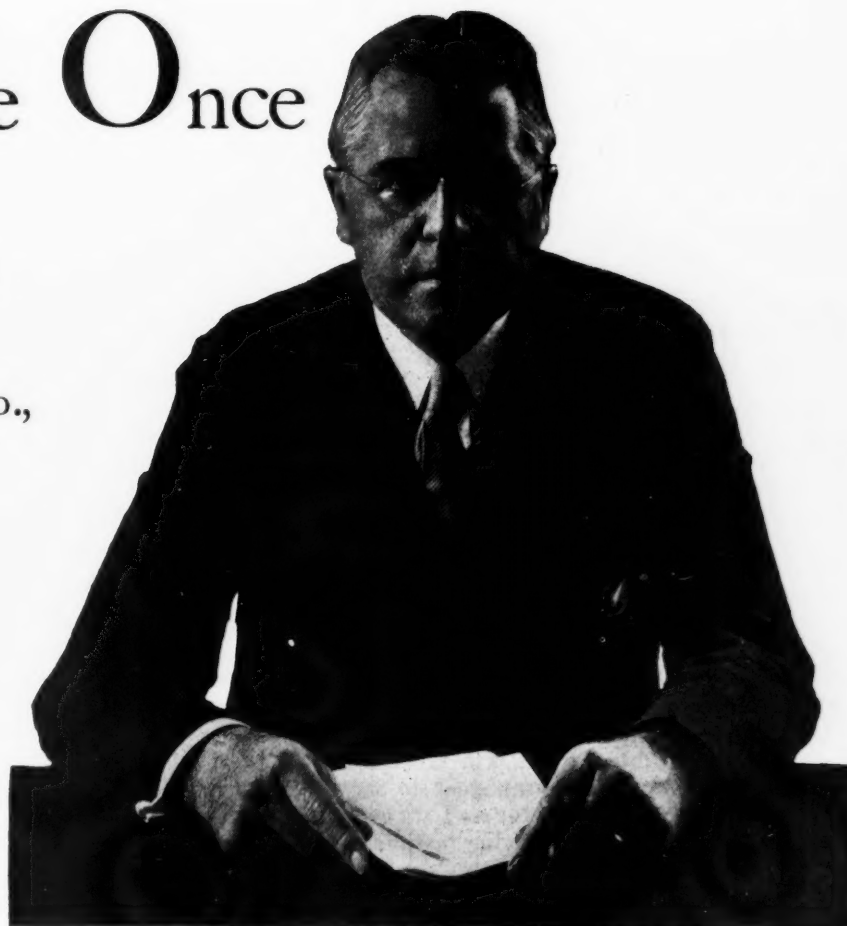
quarrying machinery up and down the Barge Canal in New York State. Mr. Glancy says he did practically everything but sell goods. At any rate, he was taken off the road and sent to the company's office in Chicago as a desk engineer.

Mr. Glancy hadn't been in Chicago long when a friend, S. R. Elliott, wrote him from Cuba offering him a good job in the iron mining industry and promising to build him a house. In 1906 he and his boyhood sweetheart, Lenora Courts, originally of Huntington, Tenn., and later of Washington, were married. In May of that year he went to Cuba, and in November came back for his bride. Alfred, Jr., their first child, was born in Cuba, the first American child born east of Santiago, and for his honor was presented with a silver cup. They resided in Cuba for about three and a half years, during which time Mr. Glancy organized the Glancy Construction Co. While his work was mostly mining engineering, he lists among his accomplishments the task of "taking the top off a mountain."

Finally Mr. Glancy came back to the United States to become associated with the Mason & Hanger Co., general contractors, as general superintendent in charge of their Northern Division. The work included many large projects such as subways, tunnels, water works, etc., and, among his tasks Mr. Glancy had charge of building two sections of the famous Catskill Aqueduct, which carries water from the Catskill Mountains to New York City.



He once took an active interest in pugilism and remembers going into the ring for three rounds but doesn't remember coming out



A. R. Glancy, president and general manager of the Oakland Motor Car Co.

duct, which carries water from the Catskill Mountains to New York City.

After six and a half years Mr. Glancy retired from the construction business and went to Philadelphia to become affiliated with Harrison Brothers, Inc., who operated immense interests throughout the country, including mining, chemicals, paints and varnishes. The financial end of this business was in the hands of Lee Higginson Co. of Boston and Mr. Glancy developed a number of properties very successfully for this company. Harrison Brothers eventually sold out to the duPonts. About this time the World War came along and Mr. Glancy started out to be a major in the engineers, but the duPonts persuaded him to go to Nashville where he built the enormous Old Hickory Powder Plant for the manufacture of explosives.

For 14 months he remained in Nashville, and after the close of the war took up other assignments for the duPonts. In the course of events he assumed the management of the Sampson Tractor Co., Janesville, Wis., which at that time was a unit of General Motors Corp. This work required most of his time from 1920 to 1924, though at the same time he was general manager of the Sheridan Motor Co., and had charge of closing this company out as a unit of General Motors. While directing the destinies of Sampson and Sheridan, he also organized the Glancy Malleable Corp. and purchased the Waukesha Malleable Iron Co., of Waukesha, Wis., from General Motors. He is still the president and principal owner of this corporation, which is one of the largest producers of malleable castings for automobiles and railroads.

He joined Oakland in 1924 as vice-president and assistant general manager and the latter part of January, 1925, became president and general manager.

One of the first things he did after becoming president was to arrange regular monthly conferences with various department heads. These conferences are divided into two groups, one consisting of production men and the other of those who are responsible for merchandising the product. At these meetings he presents a current financial statement of the company, at which time he analyzes each and every item, and besides giving suggestions, asks his men to reveal any means by which the company might cut out unnecessary waste, or how more efficient methods of manufacture can be installed so as to reflect favorably in the earning sheet.



He spent three years and a half as a construction engineer in Cuba and one of his accomplishments there was "taking the top off a mountain"

"A financial statement to me," he says "has come almost to be a Bible. . . . It is a fascinating piece of literature, for its every figure goes to show the exact condition of a company. As far as I am concerned, I am not nearly so interested in setting production records as I am in knowing that the company is operating profitably."

The conversation then drifted to the dealer. "To my mind the greatest need of the dealers is to have reliable financial statements similar to those of the manufacturer," Mr. Glancy said. "It would be the biggest aid imaginable in their business and it certainly would help them solve the used car problem, for the dealer who would watch his financial position carefully would not allow himself to become burdened with used automobiles to the point where it meant practical ruin to his business."

"The day has arrived when the dealer has got to pay more attention to many of the smaller details just like the manufacturer. He has got to be a keen business man. He has got to watch all the corners and take advantage of every opportunity. I hope our competitive dealers become well organized because our dealers have a better chance against well organized competition than against the irresponsible merchant who does not know the first principles of business."

Here Mr. Glancy used one of the illustrations which he frequently resorts to and which have made him particularly popular as a speaker at dealer meetings.

"To my mind the average automobile dealer is like the prizefighter or boxer. Just as a number of trainers do everything possible for the fighter, so do the automobile companies render similar services to the dealer, but when the dealer steps out into the field of business he is just like the fighter who has stepped through the ropes and into the ring. He has got to fight his own battle, for the seconds can do no good then."

It is his opinion that the automotive industry can still effect material increases in the efficiency of its production methods. He made this statement in referring to the new Pontiac factory which is now gradually going into production.

"While our new Pontiac plant has every known im-

provement and is supposed to be equipped to render the last word in practical and economical operation," he said, "I am sure that important strides will still be made in machinery and practice to increase efficiency."

"Engineers and production experts are constantly working on the problem of manufacturing the automobile in a more efficient manner than it was made yesterday. Take our own organization, as an example. We are conducting studies of such factors as noise, light and ventilation as a means of making improvements whereby our employees will be able to accomplish more than when working under less favorable conditions. Add improvements along these lines to those that can be made in mechanical methods and savings in production costs are bound to result."

It was in reply to a question on how he happened to enter the automobile business at so late a date that Mr. Glancy smiled, reached across his desk and picked up a leather folder containing a number of neatly written pages which was a graduation thesis he wrote in college. It is now one of his most prized possessions.

His College Thesis

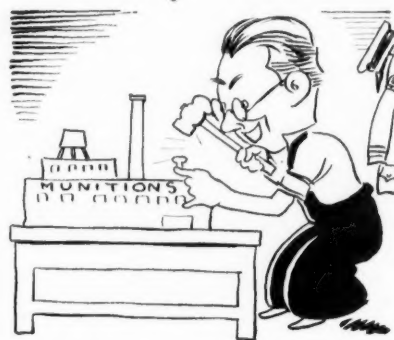
"You probably won't believe it, but I was a pessimist as far as the automobile business was concerned when I was a young man," he said. "As a matter of fact I graduated from Lehigh University in the engineering class of 1903 largely on the strength of a thesis that I, in conjunction with my pal, Paul Gerhard, now the Oakland-Pontiac dealer at Omaha, Neb., wrote, in which we stated that in our opinion the automobile was a rich man's toy and that its future was anything but promising. So it appears that I landed in the automobile business largely by accident."

Incidentally, Mr. Glancy went out and sold his college pal on the idea of getting into the automobile business himself and the result was that Mr. Gerhard became the Oakland-Pontiac representative at Omaha two years ago.

"To me, the automobile business had a mighty poor future before it. Perhaps I can be excused for my idea," he said with a smile, "for I was a mere student in school

then. But it was my honest conviction and I was so thoroughly sold on the idea that, with Gerhard, we prepared that thesis.

"I can remember it just as plain as if it happened yesterday. Gerhard and I experimented with several of the popular cars of that day and finally gave up in dis-



When the war came he started out to be a major of engineers but ended up by building a munitions plant for the duPonts

gust. For a while we worked on an old Knox which had a one-cylinder engine which stuck straight up through the floor boards. We finally stuck a steam engine lubricator on top of the engine to lubricate the piston. Then we worked around one of the four-cylinder Cadillacs and back in those days they laid much stress on the fact that their car developed 50 hp. Another car that came under our scrutiny was a Locomobile steamer. Winton was the leader in introducing the multiple-cylinder car on the market and was followed by Ca-

dillac. Packard, which still relied on a one-cylinder motor, drew comparisons between one and four-cylinder cars with the complexity of handling four small horses in the place of one big, powerful horse.

"Finally, when Gerhard and I got down to write the thesis, we took a lot of sales thunder out of the catalogs, and, when we handed that thesis in the professor said: 'Boys, why didn't you leave the cover on the catalog?'"

When Mr. Glancy entered Lehigh University he was an athletic young man with a keen interest in boxing. In those days, as at the present, there were many good second and third-rate boxers up in that mining district of Pennsylvania, and he found little trouble in gaining many unusual experiences in the roped arena.

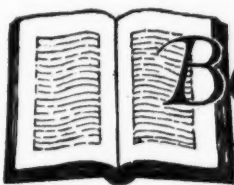
"Back in those days one of the chief requisites of a boxer was to have a manager who could collect his share of the gate before the fight started, so I was sort of manager for a number of third, fourth and fifth-rate boxers, and I got much enjoyment out of it," Mr. Glancy related. One night one of his lesser stars was unable to go on for his fight, which was being staged up in one of the mining towns, and the other boxers with whom he had been associating finally prevailed upon Mr. Glancy to take his place. "'You'll only have to stay three rounds,' they told me, 'and you certainly have boxed enough to hold this local man off that long.' At any rate their argument was convincing.

"I can remember plainly stepping into the ring. After

that I saw more gloves than I have ever seen before or since. When or how I left the ring that night was never quite clear to me. But I still enjoy watching a good fight."

The Alfred R. Glancy of today is a man who has profited materially by the wide diversity of jobs which he has successfully tackled in the 24 years since he left college. His has been a career crowned with success. But he frankly acknowledges that his success has been partly due to others. Talk with him about the administration of the big factories which he directs out at Pontiac and he will mention the fact that he leans heavily on three men, whom he terms his "three lieutenants." To this trio, which is composed of W. R. Tracy, vice-president in charge of sales; B. H. Anibal, vice-president in charge of production, and A. J. Brandt, vice-president in charge of operations, he assigns many of the knotty problems which come up in the process of administering the affairs of the company.

Mr. Glancy is a member of the Bloomfield Hills Country Club, and while he enjoys a game of golf, his greatest hobby, outside of being with his family, is reading. Traveling around various construction jobs, such as in the bleak northern country of upper Michigan and later in the wilds of Cuba, naturally made Mr. Glancy very appreciative of his family, and today he enjoys nothing more than being with Mrs. Glancy and the children. Besides Alfred, Jr., there are two daughters in the family.



Books for the Business Bookshelf

Democratization of Industry

Political and Industrial Democracy—1776-1926. W. Jett Lauck. Funk and Wagnalls Co., New York. 374 pp. \$5.

A COMPREHENSIVE survey of the movement, plans and policies of industrial democracy is the plan of Professor Lauck's treatise. A comparatively small amount of the book is occupied by a treatment of the principles and aspirations of industrial democracy and the philosophy of the movement and a very large part with the details of the attitudes of various industrial, political, social, religious and industrial organizations toward the movement and with a large number of company plans.

The reader is impressed with the comprehensiveness of the book rather than with its profoundness. Most of the material is edited from platforms, reports, plans and comments which have been published by a great variety of organizations and individuals so that the value of the work is as a convenient compilation of scattered data rather than as a contribution to thought upon the subject.

There is one significant keynote struck in the book. The title points to it and many of the extracts from reports of the various bodies quoted take up the refrain. Industrial and political democracy are not only comparable—they are inseparable. No political democracy is complete without industrial democracy as a part of the plan.

Whether one is interested as an employer, an employee, a student of world affairs or merely as a spectator of life, the book is significant. The movement

toward the democratization of industry in the many ways in which it is being developed is one of the most remarkable developments of the twentieth century.

Problems of Business

Harvard Business Reports, Vol. 2. A. W. Shaw Co., Chicago. 576 pp. \$7.50.

THIS is the second volume in the valuable series of reports of actual problems met with by businesses of all kinds and how the various managements solved them. As in the first volume, the reports cover a very wide range of business activities but a sufficient number of them deal with manufacturing problems to make the book of considerable value to persons interested in this phase of business. One addition has been made to the plan of presentation employed in the first volume. Each of the problems is now commented on, usually by a member of the faculty of the Graduate School of Business Administration, Harvard University. These comments undoubtedly add considerably to the interest and value of the reports.

Installing Selling Systems.

Financing Automobile Sales. William A. Grimes. A. W. Shaw Co., Chicago. 116 pp. \$2.50.

THIS book should be of interest to all automotive men who have anything to do with merchandising, containing, as it does, a very clear exposition of the present status of automotive time payments and the methods by which this sales plan is conducted. It includes discussions of wholesale and retail financing as well as general considerations of instalment selling.

Basic Materials Used in Magneto

Subject of Research

Problems of manufacture and design under present conditions are reviewed by British engineers. Tungsten now largely employed for magneto contacts.

A GENERAL review of the present status of magneto design, manufacture and servicing as practiced in Great Britain is given in a paper by A. P. Young and L. Griffiths, recently read before the Institution of Automobile Engineers. Magneto manufacture started in Great Britain practically at the outbreak of the war. In that country the magneto continues to be largely used for passenger car ignition, and with the rapid growth of the passenger car business in recent years the magneto industry has attained a large volume of production.

It is pointed out by the authors that conditions affecting the ignition of passenger car engines have become much more severe since 1914. The average car mileage per annum is now 8000 as compared with 4000; the average speed has increased from 25 to 30 m.p.h.; the engine speed corresponding to average road speed has increased from 1300 to 1900; the spark frequency from 43 to 63 sparks per second, and the compression ratio from 4 to 5.

Rapid expansion of the industry during the past decade has greatly stimulated research in many directions, particularly in respect to the basic materials employed. The steel most extensively used for magneto magnets is a 5 to 6 per cent tungsten steel, though in America and to some extent England 2 per cent chromium steels are employed. A considerable amount of research work has been carried out during the past decade to determine suitable criteria of magnetic quality. It is now universally agreed that the true criterion of magnetic quality is the maximum product of the coercive force (H) and the remanence (B). This value is known as the $(BH)_{\max}$ which, in the case of tungsten steels,

of about 9000, and a $(BH)_{\max}$ value of from 800,000 to 900,000, which is approximately three times the $(BH)_{\max}$ value of tungsten steel. In other words, a 35 per cent cobalt steel magnet would have about one-third the volume and weight of a tungsten steel magnet for a given duty.

Magnet steels containing 9, 15 and 35 per cent of cobalt are now being made in England in quite large quantities for use in certain types of magnetos and other electrical devices. In Table I are given comparative volumes and prices of magnets made from the various steels and designed to give the same service on a magneto of given design.

Whether cobalt steel will ultimately displace tungsten and chromium steels for magneto magnets will depend very largely upon the prevailing price of cobalt, which at the moment does not permit of its widespread application. It will, however, find a very useful application on certain types of magneto, particularly aircraft magnetos, where weight is of paramount importance, and also on rotating-magnet magnetos in which the space available for housing the magnet is restricted.

Material for Contact Points

Until recent years, the material universally employed for the magneto contact points has been an alloy consisting of 25 per cent iridium and 75 per cent platinum. As both of these are precious metals, the cost of platinum-iridium contact points is inherently high, and represents a large percentage of the total cost of the magneto. The problem of obtaining a reliable and satisfactory substitute has, therefore, received the closest attention and an excellent substitute has been found in tungsten. If the magneto is designed to fulfill certain conditions, the life of these contacts is certainly equal to that of platinum-iridium. While it would be unwise to predict that platinum-iridium ultimately will be superseded by tungsten for magneto contacts, it can be stated that tungsten is now largely employed, and its use is likely to be extended in the future.

The phenomenon of contact arcing is very complex, and any investigation of it must necessarily concern itself with what happens during the infinitesimal period of time necessary for the contacts to separate themselves by a minute distance, at the moment of "break" and the initiation of the high-tension spark. One of the authors in the "Dictionary of Applied Physics" developed a theory which takes into account two important factors:

(a) The rate of rise of voltage across the contacts during the period of separation.

(b) The relationship between the sparking voltage

TABLE I

	Average BH_{\max}	Vol. of Steel c.c.	Price per lb. Pence.†	Relative price of magnet for same purpose, allowing for manufacture, percentage.
Chromium	250,000	75.5	6	70
Tungsten	280,000	67.0	12	100
9 per cent Cobalt	450,000	41.0	25.2	120
15 per cent Cobalt	620,000	30.0	34.5	120
35 per cent Cobalt	850,000	23.0	65.0	155

varies between 260,000 and 300,000. The $(BH)_{\max}$ values of chromium steels are slightly lower.

Two British patents, Nos. 118,601 and 118,602, taken out in 1920 by a Japanese firm, describe the composition of a steel containing 35 per cent cobalt and much smaller percentages of either molybdenum, chromium or tungsten, for which remarkably high magnetic characteristics are claimed. This steel has since been found to be capable of giving a coercive force of 250, a remanence

and air gap—the sparking voltage referred to, being the voltage that must be *applied* to the contacts to produce a spark discharge for a given air gap.

This theory assumes that the sparking voltage (E_p) as referred to under (b) must be greater than the magneto primary voltage (E_p) if there is to be no arcing at the contacts. At the moment of "break," the slope of the curve connecting E_p and time can be simply expressed, assuming that there is no arcing at the contacts. Thus:

$$I_B = \frac{C \cdot dE_p}{dt} \quad (1)$$

Where,

I_B = current in primary at the moment of "break"
C = capacity of condenser farads.

This equation can be re-written:

$$\frac{dE_p}{dt} = \frac{I_B}{C} \quad (2)$$

In other words, the *slope* of the E_p curve at its origin can be reduced by keeping I_B small and C as large as possible. The theory indicates that, other things being equal, the factor dE_p/dt should be kept as low as possible to obtain perfect contact operation, which fits the known facts regarding the effect of the ratio I_B/C upon the operation of the contacts.

Experience has demonstrated that wonderfully good results can be obtained with tungsten contacts under the following conditions:

$$I_B = 3.8$$

$$C = 0.15 \times 10^{-6} \text{ farad.}$$

Therefore,

$$\frac{I_B}{C} = \frac{3.8}{0.15} \times 10^6 = 25 \times 10^6.$$

It is of great importance that the value of I_B should not exceed about 4 amps., when tungsten contacts are used, while with a platinum-iridium alloy the value of I_B can be raised with safety to 5 or 6 amps. On the other hand, tungsten, when used under the right conditions, is capable of giving even better results than platinum-iridium, as evidenced by the longer life of the contacts. Another important advantage possessed by tungsten is that when used on a single-cylinder magneto having one "break" in each revolution, so that the current always flows in the same direction across the contacts, there is not the same tendency, as with platinum-iridium, for a hill and crater to be formed on respective contact faces.

As bearing on this general question of the suitability of certain metals and alloys for use as contact materials, one of the authors found, when investigating the whole problem some years ago, that there appears to be some connection between the "suitability factor" and the physical characteristics of the metal. Table II makes this point clear.

It will be noted that the density *falls* in parallel with the "suitability factor," while the electrical and heat conductivity *increases*.

The enameled copper wire used in the high-tension or secondary winding of a magneto armature is of an extremely fine gage, usually about 0.004 in. in diameter, and approximately 1500 yards of this wire is wound on each armature. The coating of enamel is extremely thin—about 0.0005 in. thick—and must be applied with a high degree of uniformity. The enamel also must have excellent insulating properties, must be pliable to pre-

vent cracking or peeling when winding, and it must be free from small pin holes. Many difficulties were encountered in the early days but by close collaboration with the magneto manufacturers, these difficulties were overcome, and the increasing demands of the industry were met. There is still room, however, for considerable improvement.

TABLE II

Suitability Factor	Metal	Density	Specific Resistance	Heat Conductivity	Specific Heat
100	{ Iridium }	21.5	9.0	0.166	0.0303
	{ Platinum .. }				0.0315
90	Tungsten ..	19.1	9.2	0.35	0.035
70	Gold	19.3	2.08	0.70	0.0303
40	Silver	10.5	1.49	0.998	0.0559

The magneto industry depends upon the cultivation of a special species of silk worm for the finest quality of natural silk so essential to the satisfactory insulation of magneto armature windings. Woven silk of very fine mesh is imported from Japan for treatment in England. It is first dried to remove all moisture, and then passed through varnish of a linseed-oil base, being finally baked in steam-heated towers.

The manufacture of varnished silk, paper and cambric insulating materials demands great care and skill to insure uniformity of thickness and excellent insulating properties, combined with that degree of flexibility necessary for the winding of magneto armatures.

A considerable period elapsed before magneto manufacturers were able to decide upon the most suitable grade and quality of mica for condensers. The presence of very minute air bubbles in the mica plates, at first not considered detrimental, was found to be a potential source of failure. Experience has shown that only the best clear ruby mica is suitable for magneto condensers.

Other problems associated with the splitting of the raw mica and the cutting of the condenser plates to size also had to be solved. Mica is a mineral which has extraordinary cleavage properties, as it can be split into extremely thin sheets of indefinitely minute thickness. For magneto condensers, the raw material has to be split into sheets of thicknesses ranging from 0.001 in. to 0.002 in. It is not in the actual splitting that the difficulty arises, but in splitting consistently to a thickness, say, of 0.0015 in., with not more than 0.0005 in. total variation, without an excessive amount of scrap. To perform this operation efficiently requires many weeks of training, and, generally, girls are most suitable for this class of work. In selecting the girls, experience has proved very conclusively that girls of neat and tidy appearance ultimately become the best operators.

Cutting of Mica Plates

The cutting of mica plates presents a very difficult problem to the press-tool maker. Owing to the abrasive nature of the material, very special care has to be taken in making the press tools to avoid minute cracks at the edge of the plate. The tools are heat-treated to a dead hard finish, and they must at all times be maintained extremely sharp. One of the chief difficulties at first was the inconsistency of the tools of identical design, some of which would operate for quite a long time, while others would fail almost immediately. Mica condenser plates are now cut on power presses, a procedure formerly considered impossible of achievement, by those versed in the art.

Owing to the fact that the quality of mica of the same grade varies considerably, magneto manufacturers are

investigating the use of paper as a dielectric. Aside from those mentioned, other objections to mica are that it is mined only in far distant lands and that to obtain a pound of raw mica it is often necessary to extract a ton of rock, which makes its cost intrinsically high. On the average, five to eight magneto condensers are produced from a pound of raw mica.

For the purpose of paper condensers, a thin tissue or rice paper is required with a high dielectric strength, freedom from weak patches or pin holes, and good absorption properties but low porosity. Extensive tests both in the laboratory and in actual service on motor vehicles of all descriptions have proved that, providing: (1) a suitable paper is used, and (2) the manufacturing conditions are satisfactory, then it is a practical proposition to produce a paper condenser that is in all respects equal to a mica condenser. Thousands of paper condensers are in use today on motorcycle magnetos, and are giving excellent service.

The conditions under which a magneto has to operate demand that the molded insulating materials used for the high-tension moldings shall possess certain characteristics, the most important of which are:

- (1) Excellent insulating properties.
- (2) Negligible surface leakage, even in a humid atmosphere.
- (3) Good wearing qualities, a very necessary qualification in the case of carbon-brush type distributors.
- (4) Stability under varying temperatures up to 212 deg. F. Unless the material is stable under these conditions, shrinkage occurs, which, in the case of a distributor, results in loose fitting. With the carbon-brush type of distributor, the material shrinks from the segments, causing an uneven track surface and consequent rapid wear of the distributor brush.
- (5) Imperviousness to the action of ozone, which is generated in distributors of the spark-gap pattern.
- (6) Good machining characteristics.
- (7) Capability of being readily moulded to the required shape.

It will be clear from the foregoing that the problem is one bristling with difficulties, but the progress made in respect of molded insulating materials has been very rapid, particularly during the past five years.

The materials now employed can be divided into two distinct groups:

- (1) Rubber-base materials.
- (2) Synthetic-base materials.

Each group has definite physical and electrical characteristics which render it highly satisfactory for magneto requirements, provided that care is exercised in the application of the material.

The chief members of this group are known to the trade as ebonite and stabalite. The name ebonite is usually restricted to articles made from pure rubber vulcanized hard with sulphur. Stabalite and other members of this series are composed of rubber and sulphur, to which is added a percentage of filling material, giving body and rigidity to the vulcanized rubber. This latter material is the one mainly used for magneto molded insulations.

The basic materials—rubber, sulphur and filler—are compounded together, and the mixed material rolled, under pressure, into long sheets, which are rolled up and stored for use. In this condition the material is called "dough," which is soft but not pliable or resilient.

For the production of molded insulations, this "dough" is carefully placed into molds, which form the material into the required shape. These molds are then placed in steam or electrically-heated hydraulic presses and finally closed by pressure. Contact with the heated platen soon raises the temperature of the mold, and the material in it to the vulcanization point.

Synthetic-base molded insulating materials of the bakelite class now find many applications on magnetos and other ignition apparatus.

There is a tendency on modern engines to increase the setting of the plug gaps to minimize trouble due to oiling up, and if this is done injudiciously there is a grave danger of seriously increasing the electrical stress on the ignition unit. To ascertain the extent to which the plug voltage is affected by variation in the setting of the plug gap, voltage readings were taken on a four-cylinder engine using well-known plugs of foreign manufacture. The following results were obtained:

0.016 in. gap—Average peak voltage	4,100
0.030 " " "	6,500
0.041 " " "	7,700

In general, it is very undesirable from the point of view of the magneto, to increase the plug gaps greatly in excess of the normal setting, namely, 0.016 in.

Investigations into the cause of misfiring on a certain engine revealed that the spark-plug gaps were greatly in excess of the normal setting, and these same plugs, when tested in an air chamber at a gage pressure of 60 lb. per sq. in., gave peak voltages of the order of 10,000 volts, yet the cause of misfiring was attributed to a faulty magneto. The misfiring was undoubtedly due to occasional sparking at the safety gap of the magneto in consequence of the high plug voltage which resulted from maladjustment of the plug gaps.

The coil system gives its best spark at zero speed, that is, when the engine is at rest, and in this respect it has an advantage, but big strides have been made by magneto manufacturers in improving the low speed sparking magnetos of their machines and have practically eliminated this handicap. The magnitude of the improvements made can be gaged by considering the minimum sparking speeds of a four-cylinder modern magneto in relation to the performance of the same type of machine seven years ago, the respective figures being given in the table below:

Minimum Sparking Speed Using 3-Point Spark Gaps Set to Discharge at 8500 Volts

	Fully advanced	Fully retarded	Angle of timing
1920	80 r.p.m.	245 r.p.m.	25 deg.
1927	65 r.p.m.	145 r.p.m.	25 deg.

The energy content of the spark has also been increased, so that the performance at low speeds has been improved to such an extent that, for the actual speed conditions operating at starting, there is very little indeed to choose between coil and magneto ignition. This is made clear by comparing the spark energy curves of a good coil and magneto at speeds approximating to the speed at which the engine crankshaft is rotated by the electric starter. It will be noted that there is little difference in the spark energy at speeds approximating the starting speed of the engine, namely, 120 r.p.m. At higher speeds the magneto unquestionably shows a distinct superiority.

With engines on which the starting conditions are particularly severe, as, for example, on heavy commercial vehicles, tractors, etc., the use of the impulse-starter in conjunction with the magneto greatly facilitates starting. It also enables the use of a relatively small magneto.

Just Among Ourselves

When Traffic Signals Are a Hindrance

LOOKS as though the Albert Russell Erskine Bureau for Street Traffic Research were going to get a lot of publicity in "Just Among Ourselves" if it keeps on coming to conclusions which so jibe with this writer's preconceived notions as to make him applaud heartily at finding some official confirmation for our prejudices. "It should be borne in mind," says the most recent pronouncement of Miller McClintock, director of the Bureau, "that traffic signals stop traffic as well as move it and that wherever a device of this kind is installed it immediately places an automatic limit on the time the intersecting streets may be used." The danger of installing stop and go lights where they are not necessitated lies in the disregard for this type of regulation that grows when motorists are unnecessarily delayed, the Bureau's report says, adding that the need for such controls cannot be determined by casual observation but can come only from detailed survey of traffic movement.

* * *

Too Much Restriction a Source of Irritation

THERE can be little doubt of the great, although indirect, value to automotive manufacturers of every effort which can be put forth to make motoring comfortable and pleasant by removing minor irritations and increasing the free and easy flow of traffic in congested and semi-congested centers. The semi-congested area, as a matter of fact, often offers greater irritation features than does the very dense traffic of downtown streets in big cities. In the latter case, it is perfectly obvious to the individual motorist that

little speed can be made because of lack of physical space to hold the vehicles. In semi-congested areas, however, irritation often accrues from the fact that much freer flow of traffic could be possible if this and if that and if the other thing . . .

* * *

Reading Habits of Automotive Men

NOTHING interests us more than the reading habits of the various groups of automotive men with whom we come in contact, partly, of course, because we need to know something about them from a professional standpoint, but chiefly because of the rather pertinent slant which these habits often give on the outlook and potentialities of the individual. Plenty of men have reached and filled with competence positions of responsibility with practically no reading habits whatever, but our observation is that the best combination from a business standpoint seems to come in those men who have been sufficiently interested in business to pursue its rather practical ends with vigor while at the same time using as a background for their operations the broader outlook and greater mental flexibility which come from at least a fair amount of constant reading in addition to perusal of the daily newspaper. The capacity of automotive engineers particularly, it seems to us, so often turns out to be dependent upon their interests and intelligence outside the detailed technique of their profession. Standards of performance and desired ends differ so much, of course, that arbitrary statements on such a subject aren't of very much value, but we'd be interested to get the reaction of any of our readers on this subject,

either in the way of personal experiences or of observations of others.

* * *

What Do They Read After 35?

SOMEBODY said once that the average man does not read to improve his mind nor to increase his knowledge of his profession after he passes the age of 35. Our observations in the automotive field do not tend to confirm that idea, yet it does seem that as men grow older and have already acquired a certain proficiency in their chosen calling, those who have reading habits demand more and more that material concerning the detailed technique of their work be related to the general background of which it is a part. We find the outstanding engineers of the industry conceiving new ideas of thoroughly practical character as a result of reading and thinking in fields of science and literature far removed from the metal and machines through which those conceptions finally are embodied. We find factory managers and production men, unconsciously and in an entirely unpremeditated way, for the most part, taking definite and intelligent interest in general industrial trends and even in philosophical excursions which inevitably have an influence on their routine activities if only through the shaping of a particular habit of thought. And yet all of these men usually are very definitely interested as well in any new, practical and detailed applications of engineering and production work. . . . Not being able to see just where this discussion is coming out, we discontinue it for the present, but it does seem to us to be an interesting one for further speculation.—N. G. S.

A 'Low-Cost Method of Producing Metal Aircraft Pressings

Navy uses single die with sheet rubber in lieu of second matched die in working out quantity production system.

By R. D. Weyerbacher, Commander (CC) U. S. N.
Chief Engineer, Naval Aircraft Factory

MANY observers of engineering development have doubtless felt that airplane manufacture will follow the lines of automobile practice in that quantity production will bring to the front the all-metal plane, this development factor being quite as responsible for the use of metal as the shortage of satisfactory woods.

Metal construction reduces weight. That is one important advantage.

Press construction reduces the number of parts with less assembly cost. The desirability of having satisfactory designs ready for the great manufacturers to start work upon immediately, in time of national emergency, is readily perceived.

Having these ideas in mind, the aeronautical engineers of the Navy Department have endeavored to develop designs for naval airplanes adapted to the general shop processes of the large automobile builders. In following out this plan, a low-cost method for making pressings in sheet metal, which may be of interest to engineers in general, has been developed and put into use at the Naval Aircraft Factory.

The method may be briefly described as the use in a press of a single die with sheet rubber, in lieu of a second matched die. Of course, the use of rubber as a filler or forcer, in place of a liquid, in cases where hydraulic dies may be used, is not new, hav-

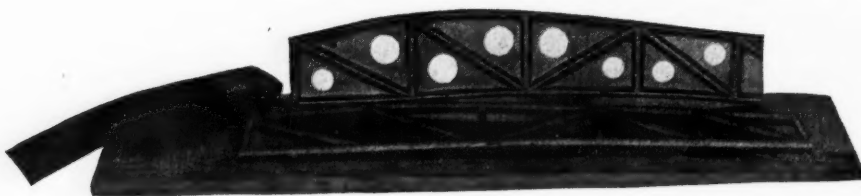
ing been known and used in the art for many years. However, it is believed that the use of rubber to make such shapes as are illustrated herewith represents pioneer work.

Some examples of the work done are given in the accompanying illustrations.

The method presents the following advantages:

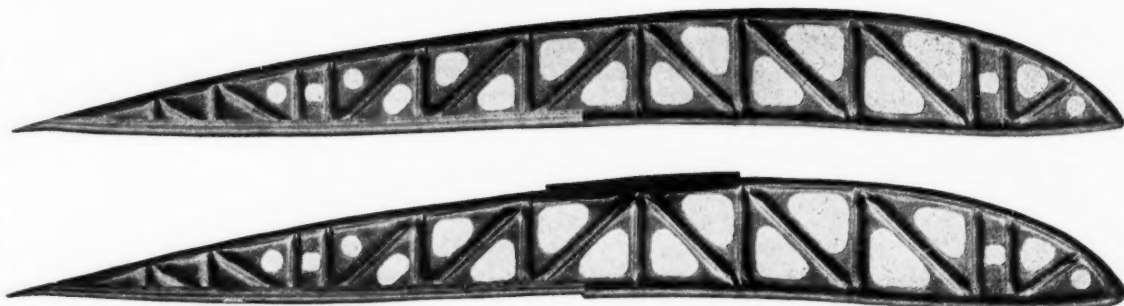
1. A single die only is needed.
2. This die may be of wood, metal or other material, depending upon the amount of use it is to have.
3. The die may be made in the most reasonable of a number of ways, depending upon which is most applicable to the work in hand; it may be cast, it may be built up, or it may be machined from stock.
4. The die need be finished only to the tolerances and with a smoothness required in the completed article, i.e. no fitting of male and female dies is required.

The illustrations given of the uses to which this process has been put at the Naval Aircraft Factory may indicate that its field of usefulness is limited to experimental work and to cases where a small number of units are to be made economically. However, further experience will doubtless develop a wider field than has been indicated by the short use so far had with the method. In cases to which it is applicable, it will show considerable savings.

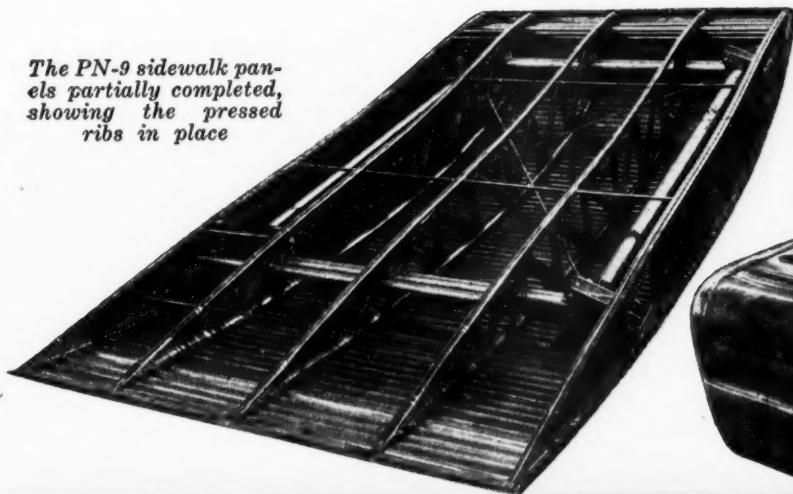


Left—View showing wooden die for making section of an experimental airplane wing rib, the formed section and a sample of rubber used

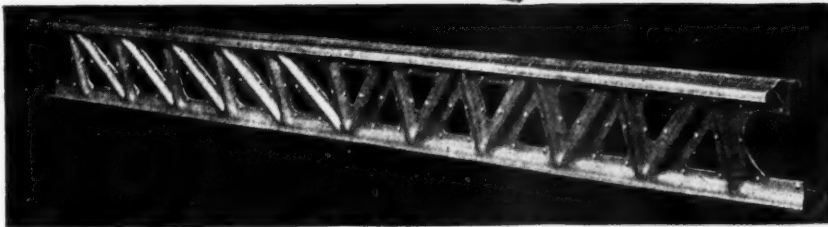
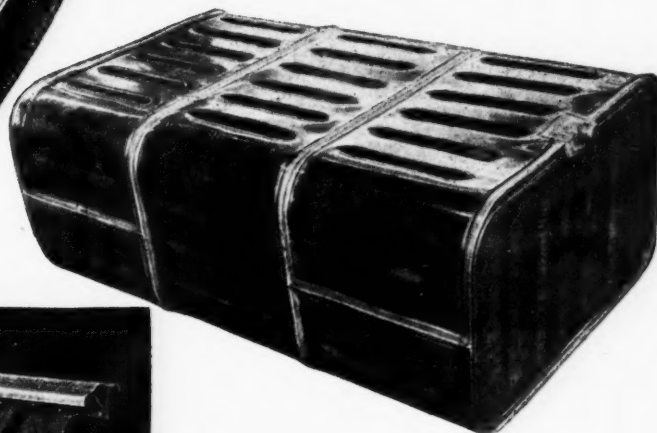
Right—Ribs used in PN-9 (Hawaii flight plane) side-walk wing panels; 9 ft. long; material .023 in. thick; made with single die. Length of rib 54½ in.; width (maximum) 11½ in.



The PN-9 sidewalk panels partially completed, showing the pressed ribs in place



PN-9 gasoline tank. The corrugations were pressed into the plates using a wooden die; material, aluminum 0.064 in. thick



Above—An experimental wing beam made with single dies for each part; material, duralumin; web 0.045 in. thick; flange 0.051 in. thick. This experimental section is 18 per cent more efficient than "I," and 17 per cent more efficient than box beam of similar dimensions

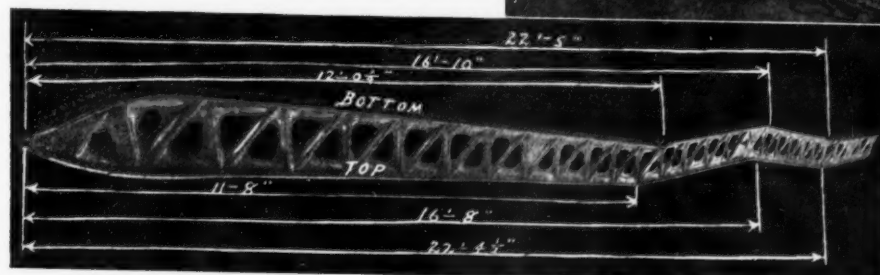
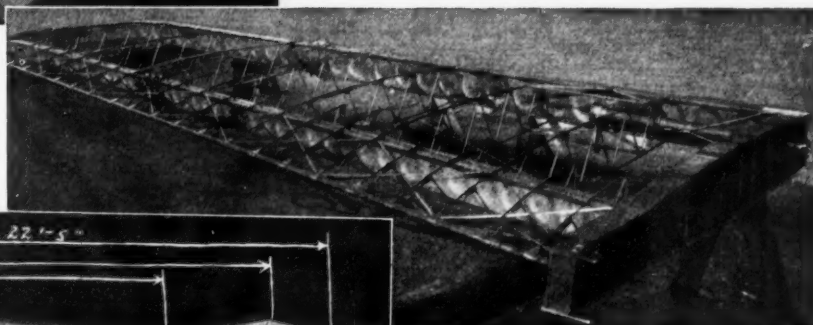


Above—Cast rough finish metal dies for forming parts of the manifolds used in the Shenandoah water recovery system; also partially completed parts; material, duralumin, 0.064 in. thick



Left—Parts of a large metal beam, also the dies from which the parts were made

Below—PN-10 pressed metal beam after second static test. This beam is slightly heavier than a built-up tubular construction. It has more continuity, thereby less chance of failure



Above—Stabilizer for PN-10 seaplanes. Attention is called to pressed beams. They are tapered and show the adaptability of the pressed type of construction

Study of Overhead is Simplified by Standard Costs

*Departmentalization of factory into production centers also
an aid in getting grasp on many of the production
expenses which are difficult to analyze.*

By K. W. Stillman

THE first step in the reduction of overhead, which, in recent articles in *Automotive Industries*, has been suggested as the chief remaining hope for important reductions in manufacturing expense, is to determine of just what items the expense burden is composed. To state that the overhead is 100 per cent or 300 per cent of the direct labor and material cost of production may be an indication of relative efficiency when compared with similar figures for other plants engaged in the same sort of work but it offers no suggestions as to where reductions can be profitably made.

It has always been the most troublesome of cost accounting problems to properly evaluate overhead and to allocate it in reasonably correct proportions to the manufactured product. It still is practically impossible to accomplish this task with anything like the accuracy with which direct labor and material costs may be handled. Developments during recent years, however, have made possible the installation of methods whereby the total burden can be quite definitely allocated and, in addition, the component parts of the burden charges can be segregated and made the object of study to determine if they are excessive.

The proper allocation of overhead has been greatly facilitated by the adoption of departmentalization of the factory into production centers while the study of individual items of the overhead account has been made possible largely through the use of standard costs. Both of these devices are now being used extensively in many modern plants and, in connection with a properly selected method of pro-rating overhead to the product, provide adequate means whereby an intelligent campaign toward reduced burden expense can be conducted.

A Cost Accounting Axiom

It is a cost accounting axiom that the fewer the products made, the more simple can the system of burden distribution be. Thus in a plant making a single line of automobiles it is obvious that the entire overhead must be charged to this single product, so that it presents no difficulties from the distribution angle, at least. But it is becoming increasingly evident that this solution is not the end of the problem even for a plant making but a single product.

The Department of Manufacture, Chamber of Commerce of the United States, has recently finished a survey of overhead accounting practices among Chamber members and the conclusions which were drawn from this work, bolstered up by the studies made by various individuals, all point to the fact that rather detailed ac-

counting for overhead is advisable in nearly all types of manufacturing enterprises.

According to most students of this phase of business, if the entire manufacturing overhead is allocated to a single product, as outlined before, there is usually a strong tendency to eliminate all detail analysis of what the burden consists of. While this method undoubtedly reduces costing expense, the fact that gross wastes may be present in some of the non-productive processes which can not be brought to the attention of the management inclines general opinion toward added expense for the sake of more detailed information.

Furthermore, in the production of automobiles in particular, which are made up of a multitude of parts, most managements want to know just what it costs to make each part in order that needless losses may not be incurred by the continued manufacture of certain items which may be purchasable outside for less than their production cost in the plant.

Detail Figures are Preferred

For these two reasons, besides many others which might be suggested, the general opinion in most progressive plants, as evidenced by the Chamber report and other sources, is that it seems advisable that overhead accounts, even in plants with simple manufacturing processes, might well be kept in sufficient detail to provide the management with rather complete information of their composition.

For plants engaged in making several lines of products, such as may be found in many accessory manufacturing plants, the need of detail control of overhead appears to be even more desirable. For pricing purposes alone practically all modern manufacturing concerns of this type recognize the advisability, if not the necessity, of reasonably accurate distribution of overhead over the many products made. Without such a scheme to permit fairly accurate knowledge of the actual manufacturing costs of each product, prices might easily be set so low on certain lines as seriously to affect total manufacturing profits and so high on others as to make them practically unsalable against competitive products priced on a real knowledge of their costs.

As was suggested in the articles referred to before, possibly one of the easiest and most practical methods of reducing the overhead problem is to charge to direct expense as many items as possible which go to make up the total manufacturing cost. The distinction between direct and indirect labor and material costs is usually determined by the facility with which the vari-

ous items may be allocated to a particular manufactured product. Thus, those expenses which are incurred directly upon the product, such as machining or assembly expenses, have been classified as direct, while all others are considered indirect.

This has been a generally satisfactory means of differentiating the two items, but, according to some observers, in the application of this definition it has been an unfortunate custom to list all doubtful items as indirect expenses whereas the reverse of this practice is considered to have produced simpler costing methods and more accurate results.

For example, the cost of operating an inspection department is quite commonly classified as an indirect expense. For inspection supervision, as with general supervision, this is an almost universally accepted practice. But for the actual work of inspection, in automotive plants in particular, there are some who believe that this easily could be transferred to a direct charge against the product being inspected. They point out that inspection has become almost as specialized in automotive plants as production. The inspection of cylinder blocks, pistons, crankshafts, and many other items are quite generally specialized jobs, each one being handled by men assigned to that particular work. Since, then, the labor and material cost of this work can be definitely allocated to the product, many plants are removing this large expense item from the catch-all, overhead account and placing it where it seems to belong—a direct charge against the inspected parts.

Transportation of Materials

Transportation of materials is another item of expense which at one time was almost invariably considered a legitimate part of overhead. In many instances this still may be the only way it can be handled satisfactorily but a number of cases are being found in which it has been possible to take a part of this expense, at least, from burden charges and apply it directly to the product. A typical example is that of a workman who, with a truck, spends most of his time in bringing cylinder blocks from the foundry to the machine floor. Such jobs as this seem to lend themselves readily to transfer from indirect to direct charges.

A third item, once considered overhead by nearly all accountants, but whose position is now being questioned by some, is that of work spoiled in process. If three cylinder blocks are spoiled out of 100 arriving at the machine shop it appears to be at least as fair to make the 97 good castings absorb the labor and material expended on the spoiled pieces as to spread this cost over the whole department or plant through an increased general overhead. Charging spoiled work against the cost of good work is now common practice in many plants.

When as many items of indirect expense as possible have been transferred to the direct expense accounts the remaining items of overhead should be known in detail, according to the results of the Chamber survey referred to before. The degree of breakdown depends upon the particular plant, of course, but it should be sufficiently detailed so that the management can make ready comparisons of present costs with standard costs for all the important items. One plant, cited in the report, has the following detail items of overhead charged individually against a single production center: Belting, grinding wheels, tools, supplies, stationery, sweepers, movemen, inspectors, supervision. This indicates the degree of breakdown which is already being made in many plants.

As a standard of comparison with actual costs there

are two methods in common use, average costs over some period in the past and standard costs built up from time studies, job analysis, etc. In plants where standard costs are not available the first plan must, of course, be used. In a number of cases cited in the Chamber report, standard costs are preferred and most other authorities on budgeting methods advise the use of standards wherever possible.

What a Standard Cost Should Be

A standard cost, according to G. Charter Harrison in *Management's Handbook*, should not be a theoretically possible cost but one which it is reasonable to expect may be attained and maintained with first-class workmen under first-class conditions. Comparisons of actual costs with costs obtained in this manner are generally considered more valuable to the management in determining where improvement may be needed than comparisons with past performances which may or may not bear any relation to the performance which should have been obtained under proper conditions. Standard costs, made up by departments or by production centers, give the departmental managers something definite upon which to base their future plans and quite definitely allocate responsibility for failure to obtain standard results.

The next problem in the operation of overhead accounts is that of pro-rating the burden to the various departments and from there to the product. Although there are a number of ways of doing this, no one of them seems to meet all requirements. The most recent development is the machine-hour rate which consists of assigning to each machine in the factory a rate per hour which, it is estimated, will absorb the total burden expense for the period. This method, however, does not ordinarily care for general supervision expense and others which cannot be directly allocated to particular machines and, in factories where the ratio of labor cost to machine cost is high, is not considered to give very reliable results.

The Labor Cost Method

One of the oldest forms of burden distribution is the percentage of labor cost method which is based on the assumption that burden costs vary directly with direct labor cost. Thus, it is assumed, that the more direct labor expended on a product the greater the use of manufacturing facilities involved in its production. While of real value in many shops producing products of similar construction, this method is not looked on with great favor by many because its use gives no consideration to the relative amount of expensive machine tool equipment and other facilities employed in the production of the product. A third method of the same type as this is one which uses labor hours instead of wages as the vehicle for overhead distribution.

The general opinion now seems to be that the selection of one of these methods or of others which are available depends almost entirely upon the conditions to be found in the plant and that with proper departmentalization of the factory any one of them will produce satisfactory results.

This matter of departmentalization is receiving a great deal of attention at present and, according to the Chamber survey, is a very important item in the construction of an effective overhead distribution scheme. Reporting members express a strong preference for the so-called production center plan in which machines and processes are grouped according to their type, even though several different groups may be contained in a single department, from a supervisory standpoint.

Thus, automatic screw machines might be one group operating beside another group consisting of several drill presses, while a third production center might consist of a single, special purpose machine or a series of work benches for assembly or inspection work.

Vehicle Employed is Immaterial

When such small production centers are made the basis for overhead distribution the particular vehicle employed for it is considered to make little difference. It is pointed out that screw machine operators will all receive about the same rate of pay so that the labor wage plan would work satisfactorily while, obviously, the machine hour plan would be suitable for such conditions. The drill press operators, on the other hand, might work for a quite different wage scale, their machines might carry quite different burdens than the screw machines so that treating the two group separately should produce much more accurate results than if they were combined in a plant or departmental burden rate regardless of the distribution vehicle employed.

When factory overhead can be determined and properly allocated, it then becomes possible for the management to take definite steps toward its reduction, not

as a mass action which might prove fruitless of results, but by well directed attacks at those particular items which are shown to be out of line with the general operating efficiency of the plant.

In conclusion, it might be well to summarize the points made before by quoting from the Chamber of Commerce Report the six steps which they found to be advisable in the design of an overhead structure:

1. Departmentalize the business into production centers, service centers and general overhead centers.
2. Accumulate items of overhead for the several production, service and general overhead centers.
3. Allocate the overhead of the general overhead centers to the service and production centers according to the responsibility of each for the incurrence of the general overhead.
4. Apportion the overhead of the service centers to the production centers for which the several service centers are maintained.
5. Select suitable overhead rate plans by which to distribute this overhead to the goods produced.
6. Determine normal rates, which involves the normal output of each production center and the normal amount of overhead for this normal production.

Says Durant Could Have Bought Ford for \$8,000,000

HOW W. C. Durant tried some years ago to buy the Ford Motor Co., the readiness of Henry Ford to sell at a figure that was mutually satisfactory, and the eventual collapse of the deal through the unwillingness of bankers to finance it, is told by Theodore F. MacManus, the advertising man, in his recently published book, "The Sword-Arm of Business."

The idea was planted in Mr. Durant's mind at a doleful conference in the Administration Building of the General Motors Co., at Flint, Mich., when it was apparent that Durant control of General Motors was nearing the end. Mr. MacManus relates that he said to the manufacturer:

"Mr. Durant, will you permit me to say something which is intended to be helpful but may sound like an intrusion upon your private affairs?"

"Go ahead," said the Big Little Man.

"Has it ever occurred to you, Mr. Durant, that when a man's credit is threatened with impairment it sometimes helps immensely if he can contrive in some way to go out and buy a property of known value?"

Asked to Elucidate

"Mr. Durant looked puzzled and asked the publicist to elucidate.

"What property could I buy if I were able?" said Mr. Durant.

"The Ford business."

"I couldn't buy the Ford business," he said scornfully.

"How do you know you couldn't?" was the rejoinder, and immediately he retorted:

"How do you know I could?"

"I don't," replied the publicist, "but I think it's at least a possibility."

"What makes you think so?"

"Something said to me."

"By whom?"

"By a man who ought to know."

"What did he say?"

"Mr. Durant was told what the unknown had said.

"Can you make an appointment with him?" he asked.

"I can," said the scribe.

"At this point Mr. Durant began to register excitement. We drove down to dinner. The appointment with the mysterious third party was made and kept—Monday night at the Detroit Club. Then the publicist faded out of the picture.

"The years went by, Mr. Durant and the publicist met again—this time in a room at the Detroit Athletic Club, with a group of General Motors officials. It was the moment of Mr. Durant's second reincarnation or resurrection. Mr. Ford, his mammoth volume and huge profits were being idly discussed. Mr. Durant raised his head so that he could look over the other heads in the group and smiled at the publicist.

"And to think," he said sadly, "that I could have had that business for eight million dollars."

"What's that?" said the startled publicist.

"Mr. Durant uttered just one word—'Yes!'"

"Did you pursue those negotiations?"

"I did."

"With the owners themselves?"

"Yes."

"A figure was fixed?"

"Yes—eight million dollars!"

"What happened?"

"The banks wouldn't let me have the money."

"And that's that. Perhaps there was a little question of swapping stock involved. I do not know and do not care. The interesting thing is that there was at least willingness to talk business. Presumably a price was arrived at. A thing that has climbed toward a billion was talked of in paltry millions. Even supermen are not wizards. They are not inspired seers. They cannot gaze down the years and see their own destiny unrolling. The most they do, even in the rare and exceptional cases, in all probability, is to hope and plan—and keep on working."

Car Census in Four Countries Shows American Makes Predominating

*Figures from New Zealand, Hawaii and two African territories
reveal relative status of various U. S. makes and also
comparative strength of foreign manufacturers.*

DURING recent years many more or less accurate guesses have been made concerning the relative distribution of cars by makes in various foreign markets. It is only very recently, however, that means have been established by which these data can be obtained with any degree of accuracy from certain countries.

In the accompanying table are given actual car registrations by makes for four markets of considerable importance—British South Africa; Kenya in British East Africa; New Zealand and the Hawaiian Islands. The published reports from all of these countries do not contain complete registrations but only registrations of cars which are most commonly used.

Although the reports are incomplete they still provide rather interesting information regarding the relative status of various American cars and also as to how the products of American factories sell in comparison with those of other countries.

In South Africa, for example, there are 13 makes of American cars which have been sold in greater quantities than any car of foreign make. In New Zealand there are eight American cars which are appar-

ent than the Rugby, the most popular product of other countries.

In Kenya and Hawaiian Islands, cars from other countries are so few that they were not included in the tabulation. This might be expected in Hawaii but is interesting in connection with British East Africa. An item of interest in connection with Kenya registrations is that after deducting all motor vehicles owned by non-white population there is one vehicle for every two white inhabitants in the country.

In Kenya, also, information regarding truck registrations is available. Of the 622 trucks registered, Fords comprise 40 per cent; Chevrolet 32 per cent; Reo, 4 per cent; Overland 4 per cent and other American makes 10 per cent, leaving 10 per cent for products of other countries of which Morris, the British car, comprises 5 per cent.

The report from South Africa was furnished by the director of census and statistics of the Union; from New Zealand by *The Radiator*, the publication issued by the N. Z. Motor Trade Association; from Kenya by the Royal East African Automobile Association, and from Hawaiian Islands by the Royal Hawaiian Sales Co., Ltd.

Car Registrations by Makes in Foreign Countries

	Union of South Africa	New Zealand	Kenya	Hawaiian Islands
American Makes				
Buick	4,466	7,965	175	2,555
Chevrolet ...	6,627	7,035	365	3,208
Chrysler	1,451	1,046	85	463
Dodge	8,101	7,628	240	1,158
Durant	880	?	380	128
Essex	1,955	2,442	?	1,062
Ford	16,728	27,670	1,000	9,222
Hudson	1,063	1,673	?	732
Hupmobile ..	3,298	?	155	317
Maxwell	1,834	?	?	93
Oakland	1,191	2,397	?	215
Oldsmobile ..	1,306	?	?	211
Overland	4,625	4,369	310	338
Studebaker ..	2,830	4,370	85	1,941
Willys-Knight	551	?	?	291
Other American Makes.	?		240	
Foreign Makes				
Austin	936	1,421		
Fiat	965	?		
Morris	819	1,370		
Rugby	953	1,830		
All Others ...	6,907		420	
Total	68,422	95,511*	3,469	25,191

*Sept. 30, 1926.

In the Realm of Metallurgy—

Automotive companies may do their own chromium plating or have it done outside. Lautal, a new alloy.

A CONSOLIDATION was effected some time ago of the Chromium Products Corp., which is a subsidiary of the Metal & Thermit Corp., New York, with the Chemical Treatment Co., for the purpose of developing certain processes of chromium plating on which patents had been issued to and applied for by these companies. The name of the new organization is the Chromium Corp. of America and it has its headquarters in New York City. Plating plants are operated in Chicago and in Waterbury, Conn. The Waterbury plant comprises two departments, experimental and production.

It is realized that on very large production, plating plants must be installed directly in the factory which wants to plate certain parts, whereas in the case of smaller production, and especially where this is intermittent, it is best to send the parts out to be plated in a plant specializing in this line of work.

Where a large producer shows an interest in the process it is customary for the corporation to ask for samples of the parts to be plated, so as to enable it to work out the most efficient methods at its experimental plant. Usually the prospective licensee wants to get some idea as to the probable cost of working the process. This, of course, cannot be determined on a single part and a fair size lot is required to arrive at an even approximate answer to this question. The experimental department, however, is in position to put through such lots with a view to determining approximate costs.

In the automotive industry the interest in chromium plating so far has centered chiefly around the exposed parts at the front of the car, the most important of which is the radiator shell. However, if the radiator shell is chromium-plated it is practically necessary that the other bright parts at the front, such as the lamps, radiator cap, etc., be plated with the same metal, for the sake of uniform appearance. This somewhat complicates the task of introducing the system, as the different parts are made in parts factories.

Chromium plating also has a field in connection with manufacturing equipment, due to the extreme hardness of the layer deposited. Very good results are being obtained from gages or gage blocks which are thus plated.

At the present time the Chromium Corp. of America owns four U. S. patents, while others are pending. The patents issued are as follows: George Grube, No. 1,496,845, issued June 10, 1924, covering the use of a bath containing chromium trioxide, chromic hydroxide and an acid other than chromic acid capable of dissolving chromic hydroxide; Colin G. Fink, No. 1,581,188, issued April 20, 1926, covering the use in the bath of a catalyst having an acid rad-



ical which is stable in the bath and remains so under the electrolytic action, and the use of a film of hydrogen on the cathode to protect the chromium iron against the oxidizing influence of the chromic acid; this film being produced by using a high current density; K. W. Schwartz, No. 1,589,988, issued June 22, 1926, covering the use of a chromium anode in the plating bath, instead of depositing chromium solely from the chromium salts of the bath and adding chromic acid as required, thus cheapening the operation and stabilizing the character of the deposit; and J. M. Hosdowich, No. 1,590,170, issued June 22, 1926, covering the use in the bath of small additions of soluble salts of various metals more negative than chromium in the electrochemical series, which increase the throwing power and are not deposited on the cathode.

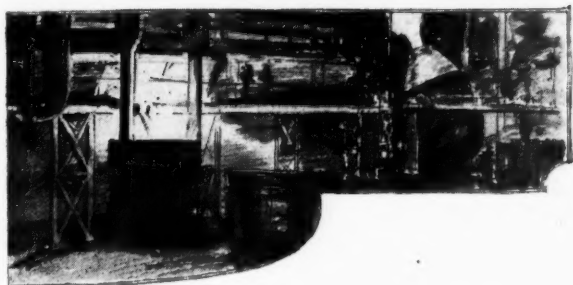
Lautal, a New Light Alloy

EXTENSIVE use is being made at the present time, especially in the aircraft industry, of the aluminum alloy duralumin, which has age-hardening properties. A somewhat similar alloy, known as Y-alloy, was developed in England during the war and also has come into wide use, in that country. Both the Y-alloy and duralumin are rendered quite soft and workable by heating them to about 930 deg. Fahr. and afterwards quenching them. Age-hardening begins almost immediately and at room temperature is complete in about seven days.

A forgeable aluminum alloy known as Lautal has come into prominence recently and also is subject to age-hardening. It differs from the two alloys previously mentioned in that it does not harden automatically at room temperature but requires a special tempering treatment in order to attain its maximum tensile strength and hardness, and this is claimed as the chief advantage by the manufacturers. Since the mechanical properties of the metal are not affected by long storage, the heat treatment is applied to the completed parts after forging and machining. This treatment consists of heating in an oil bath at 250-270 deg. Fahr. for 16 hours. The following information on this new alloy is taken from an article in *Engineering* of London:

Lautal is a ternary light alloy; it contains 4 per cent of copper, 2 per cent of silicon, and the remain-

New Processes and Materials



der is made up of aluminum of commercial purity, containing iron up to the usual maximum. After casting, the metal is thoroughly worked by rolling or pressing, which process imparts high strength to the resultant material. The alloy may then be brought up to its maximum strength by quenching it at a suitable temperature and following this up by the low-temperature tempering treatment. The properties of the material have been investigated by Drs. V. Fuss and H. Bohner (Zeitschrift für Metallkunde, Jan., 1925), who state that the quenching temperature should lie between 896 deg. Fahr. and 930 deg. Fahr.; they further recommend that the heating up of the metal to this temperature should be carried out in a salt-bath furnace.

The alloy Lantal is produced by Lantal-Walzwerk G.m.b.H., Bonn-on-Rhine, Germany, who supply four grades of the material, the properties of each of which vary in strength and hardness.

Materials for Worm Gear Blanks

REFERRING to remarks made in a paper on "Bronze Worm Gear Blanks Produced by Centrifugal Casting," read at a session of the Institute of Metals, C. J. Fitzpatrick contributes some observations on the production of worm gear blanks from his extended experience in this line in the United States, to several British engineering publications.

Much has had to be done, Mr. Fitzpatrick observes, to reach the present high state of efficiency in worm gearing, and, having to consider a semi-sliding condition, not the least difficulty has been to obtain a suitable gear bronze, whereby the lowest coefficient of friction might be obtained.

Copper-tin alloys have, in a general way, always seemed to offer the best anti-friction properties and, most generally have been adopted. A copper-aluminum bronze, essentially 90 per cent Cu, 10 per cent Al, has in some instances been used. From the writer's experience, a higher coefficient of friction seems inherent to this material, and while he has made many thousands of gears for one prominent manufacturer from this alloy, he is only partial to it where ultimate strength is an essential. In this respect the copper-aluminum bronze is far superior to the copper-tin alloys.

The point of ultimate strength is of considerable value under certain conditions found by some motor

*Finding suitable gear bronze a problem
in production of worm gear blanks.*

Cutting of metals studied.

manufacturers under present-day tendencies to build lower vehicles. Road wheels of smaller diameters are being used, but road clearance must be maintained.

The high unit pressures permissible in modern worm gearing have led to smaller gears, and so the road clearance has in some cases been maintained. In so far as the differential is usually fitted inside the worm wheel, and as a certain inner diameter must be maintained to accomplish this object, the result has in some cases been a rather frail wall to the gear. The value of aluminum bronzes in such instances, with their high tensile strength, must be obvious. As, however, many people have not been satisfied with regard to the anti-friction properties of the aluminum bronzes, the result has been many experiments to improve the ultimate strength of copper-tin bronzes, the anti-friction values of which are universally recognized.

Chilling, first by ring chills, and later by complete dies, and also centrifugal castings have been tried.

Centrifugal castings have been made under varying pressures, and while the writer has not found the pressure to be used at all critical, excellent results have been obtained by this method. Die castings have also produced very excellent results when properly made. The size of the chills, the pouring temperature, and a suitable coating for the dies have all been points which have been deeply considered. When the chilling effect is sufficient to drive completely through the section of the casting, without tapering off towards the center, the ideal condition in this process is obtained, and microphotographs and physical tests will point to a very excellent gear, comparing favorably with anything seen from the centrifugal process.

In centrifugal castings one must guard carefully against a tendency for the metal to freeze in layers, like a spiral spring or lathe scroll, and further, the centrifugal effect has a tendency to erode the inner refractory core. This remark in particular applies to a gear of which the inner periphery is not an unbroken circle but is fitted with lugs, etc., for purposes of attaching the differential.

Cutting of Metals Studied

DURING the last three years an investigation has been conducted in the Machine Tool Laboratory of the University of Michigan on elementary principles involved in the cutting of metals.

At the beginning it was decided that the experiments should be confined to an investigation of a basic scientific, rather than a practical, applied nature. It was felt that the influence of the curvature of the surface cut should be eliminated by confining the cuts to straight lines; also, that each cut should be of sufficient

length to permit the conditions of cutting to become uniform at the instant the reading was taken. In order to secure a straight line cut having a constant cutting speed throughout the stroke, a planer was selected as the machine tool on which the work would be done.

It was endeavored in the investigation to determine the influence of (a) the degree of sharpness of the cutting tool; (b) the cutting edge back of the tool; (c) the front rake of the tool; (d) side rake (skew); (e) of the depth of cut or width of cut on the force on the tool or the energy required to remove a certain volume of metal. Each of the above factors was investigated separately, being varied, while all other factors remained the same. It was also endeavored to find a relation between the force on a tool of a given shape required to remove a specific chip of a given material and its physical or chemical properties.

Nine representative types of material were cut, including three carbon steels, three alloy steels, brass and annealed and unannealed cast iron. The cutting was confined to straight-line motion on a planer, and the tools used were of the end-cutting type. No cutting fluids were used, and but one element was varied at a time.

The results show that the clearance angle has no influence on the force on the tool so long as the tool does not drag on the work; that the force on the tool remains constant for a wide variation of keenness of cutting edge and for thick chips, particularly, the tool edge may be rounded to 1/64 in. diameter without appreciable increase in the cutting force. It is also shown that the cutting force on the tool is reduced in direct proportion to the increase in front-rake angle, all other factors remaining constant. It is shown that thick chips are removed more efficiently than thin chips, and that narrow chips are removed more efficiently than wide chips. The results also indicate that there is an apparent relation between some of the physical properties of the metals and their machineability or the cutting force on the tool for the carbon steels in one group, the alloy steels in a second group, and cast iron in a third group.

A complete account of the tests, together with a bibliography of tests on the machineability of materials is to be found in Engineering Research Bulletin No. 5 of the Department of Engineering Research, University of Michigan, entitled "The Elements of Metal Cutting," by Orlan W. Boston, published by the University, Ann Arbor, Mich.

Wear of Blanking Dies

IN a paper presented at a sectional meeting of the American Society for Steel Treating, at Washington, W. J. Merten, metallurgical engineer of the Westinghouse Electric & Mfg. Co., discussed the wear resistance of the cutting edges of blanking dies and shear blades. He said it was universally recognized that shearing and blanking of sheet steel covered with hammer or roll scale (Fe_2O_3) would dull or wear down the cutting edge of die parts and shear blades and produce a burr earlier than when this scale is absent. Hammer scale is an abrasive and quite hard as compared with low carbon steel. It has a mineral hardness on the Moh scale of 5.5 to 6.5. However, a scale-free material is commercially impractical, and recourse has been had to the use of highly adhesive greases as lubricants, which have been found to practically neutralize the scoring tendency of the scale. Furthermore, it has been recognized that the imbedding of the crushed crystals of iron oxide scale

and the prevention of their pulverization, spreading and lodging between the cutting edges, is responsible for the improved results.

Iron silicide crystals (FeSi) in silicon sheet having a considerably greater abrasive quality than iron scale, react similarly on the cutting edges of tools, and the tendency to dull the edge is very pronounced if a crushing or pulverizing of crystals takes place and precedes the shearing of the sheet. Evidently, any process or method resulting in a splitting of the iron silicide crystals without powdering or severe fragmentation necessarily aids in the retention of the sharp cutting edge and prolongs the life of the die or shear blade.

In order to bring about splitting of the hard crystals, rather than crushing, the following three methods are employed:

1. Baking on of a coating of lubricating enamel.
2. Inserting a layer of paper on top of sheet, i. e., between punch and sheet.
3. Depositing a soft metallic coating such as copper or lead on the surface by dipping sheets into a solution of hot copper sulphate (CuSO_4) or lead acetate ($\text{Pb C}_2\text{H}_3\text{O}_2$).

All have the same object, namely, to fill the small surface cavities and imperfections and lock or imbed the exposed hard and brittle particles, thereby preventing their fragmentation or powdering and spreading just prior to subjecting the softer ground mass of the sheet to shearing stresses. The more securely such imbedding or locking is, the greater the life and the better the performance of the cutting edge. Deposits of metallic copper or lead obtained from dipping sheets in a solution which precipitates these metals on the sheets should give most satisfactory results. They are, however, not favored, on account of the high cost of these materials and the more expensive methods of processes for deposition and application.

The effect on the dies when the supporting matrix of brittle crystals, that is, the soft iron, is removed by pickling, is strikingly illustrated by some figures quoted by Mr. Merten. The pickling acid (sulphuric) acts only on the iron matrix, the iron silicide being practically insoluble in it. The pickling process exposes the silicide crystals and apparently excessive powdering and spreading take place. When punching pickled sheets, only 580 lb. of blank was punched between grinds, as compared with 1200 lb. with bare mill annealed sheet, 1500 lb. of enameled, pickled sheet and 2000 lb. of enameled, mill-annealed sheet.

Up to recently it was considered the best practice to use a hard die plate and a soft punch, which latter could be refitted by peening the cutting edge. Now that hard, tough alloy steels with high resistance to abrasion are available, punches can be made of this material without danger of chipping the edges. The steel now most favored for blanking dies contains from 2.00 to 2.25 per cent of carbon and from 10 to 12 per cent of chromium, and is quenched at 1800 deg. Fahr. and drawn at 600 deg.

Mr. Merten's paper was accompanied by a number of photomicrographic cross-sectional views of punched sheet. From an examination of these views the conclusion was reached that a soft punch and hard die plate combination produces a dragging effect extending a considerable distance into the blank. This plastic deformation does not result in a burr, such as is produced by a dulled hard punch. A minimum plastic deformation is obtained by the use of punches and dies which are uniformly hard.



Electric Arc Welders Used in Willys-Knight Body Assembly Line

Found advantageous in formation of joint between
cowl sheet and stamped truss bar forming
foundation of the windshield frame.

UTILIZATION of electric arc welders on the Willys-Knight body assembly line constitutes a departure from usual practice. Particular emphasis is placed on the advantages of arc welding on the formation of the joint between the cowl sheet and the stamped truss bar which is the foundation of the windshield frame. As usual, the cowl sheet is stamped from 20-gage steel while the truss bar is a 9-gage stamping which is approximately S-section and curves to form the contour of the cowl at the base of the windshield.

Water-Tight Joint

A water-tight joint is essential at this point and in the past both soldering and brazing have been tried. Both of these methods had pronounced disadvantages. Soldering produced a joint which temporarily was water-tight, of good appearance and easy to finish. However, the mechanical weakness of the soldered joint eliminated that possibility. Brazing and torch welding both had the disadvantage of applying too much heat to the cowl sheet and thereby caused warping and wavy appearance.

In the arc welding method, the relatively thin cowl sheet is fitted snugly to the truss bar and then five or six small deposits of metal are made to spot the joint. Following this a continuous bead of metal is deposited across the entire joint. The welding current is 50-60 amperes and soft flowing wire of 3/32 in. diameter is used for the deposit.

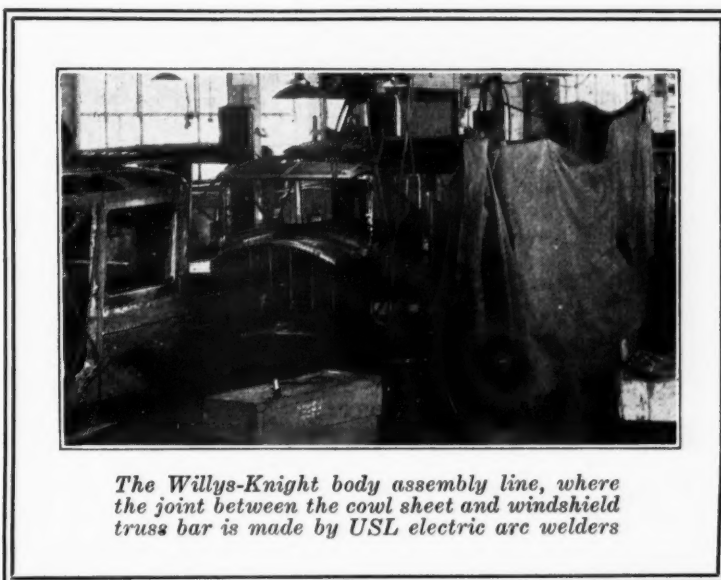
As shown by the accompanying view, the USL arc welders are mounted on platforms suspended from the ceiling. Long flexible welding leads extend from the welders and facilitate the work of the operators on the line. Controls which include a motor starter and field

rheostat for each welder are located on adjacent posts within easy reach of the individual operators. Field rheostats are equipped with dials which are calibrated in amperes. Within the space of two adjacent graduations, the operator can control the current in steps of five to six amperes.

This method of attaching the cowl sheet has proved economical from the standpoint of both labor and material, and the quality of work turned out. Following the welding operation, the joint is finished off by a portable electric grinder and then polished preparatory to the paint shop operations.

The Operator

Experience has demonstrated that a totally inexperienced operator can produce very satisfactory work after a few hours of instruction and practice. Proper preparation of the work and the flexibility of the arc welder are stated to be largely responsible for this advantage.



The Willys-Knight body assembly line, where the joint between the cowl sheet and windshield truss bar is made by USL electric arc welders

INVESTIGATIONS

have been made at the Department of

Engineering Research, University of Michigan, to discover means of determining mathematically the degree of natural illumination produced inside a building by any arrangement of windows at any point on a working plane. The theoretical methods developed during this investigation have been checked by tests on actual buildings and on models.

Details of the investigation with the results attained have been published in Engineering Research Bulletin No. 6, entitled A Method for Predicting Daylight from Windows. This bulletin has been prepared by H. H. Higbee and W. C. Randall, the former of the University and the latter from the Detroit Steel Products Co.

AUTOMOTIVE **NEWS SECTION** INDUSTRIES

Philadelphia, Pennsylvania

Saturday, April 16, 1927

High Production Continues as Seasonal Sales Improve

PHILADELPHIA, April 16—Reports from practically every important automobile producing company continue to show increased shipments. There is every indication that seasonal sales are holding up very strongly and are improving from week to week. Under the influence of this activity dealer stocks are holding sound levels.

That the industry has not reached a volume equal to last year at this season is due almost entirely to reduced demand for Ford cars and one or two other normally large producers. In the Ford case and that of the others, demand has not reached former year proportions owing to public expectancy of model changes. Though some part of the business that these companies normally would get is going to other producers, there is ample indication that many buyers are deferring purchases.

Despite this condition the industry in March produced within 15 per cent of its total in March last year when nearly all factories were at capacity. April is almost certain to show further gains.

Sales by producers in the higher priced lines show general increases over last year's business. To some extent this has been influenced by price reductions. The generally well balanced division of buying in the medium priced fields continues to hold these prices firm.

Chandler Schedules 4000, Adds New Sedan at \$995

CLEVELAND, April 11—Chandler-Cleveland March sales showed a big increase over the same month a year ago. As a result the April production schedule calls for the manufacture of about 4000 cars which will be a gain of nearly 1500 over March.

A new standard six sedan priced at \$995 has been added. The car is finished in two color options with upholstery in gray broadcloth and circassian walnut finished instrument board, window moldings and decorative door panels. With the new sedan the standard six line now includes seven models.

Gabriel Shipments Gain

CLEVELAND, April 12—According to George H. Ralls, president, Gabriel Snubber shipped 150,000 more snubbers during the first quarter of 1927 than during the same period last year. This is an increase of 31 per cent.

The company reported a net income of \$333,952 for the quarter ended March 31, as compared with \$257,518 or \$1.28 a share earned in the first quarter last year.

Peugeot Makes Car for Sale in America

NEW YORK, April 12—The first foreign small car to invade the American field on a large scale will be the Peugeot, under plans formulated by the recently organized Peugeot American Corp., which has opened offices and salesrooms here at 171 West Fifty-seventh St. American capital is back of the project.

The Peugeot company of Paris has developed a new type for the American market. It is being sold here in two models, at \$1,085 delivered in New York for the convertible cabriolet, and \$1,050 for the convertible touring car. The engine is rated at 7 hp., has four cylinders, 60 x 90 millimeters, wheelbase is 89½ in. and tread 38 in. The car develops 50 to 55 miles per hour and does 45 miles to the gallon.

Stressing the sport character of the cars, the company is importing them unpainted, allowing the purchaser to choose his color combination. A fabric body option is provided on the touring car. American wheels and tires 27 x 4.40 are provided but the remainder of the car is entirely made in France.

Yves De Villers is president of the Peugeot American Corp. as well as American representative for the Peugeot company. Other officers of the corporation are Paul Barringer, acting vice-president; Paul Jackson, treasurer; John R. Dane, secretary and general manager, and John W. Hessian, sales manager. Mr. Hessian was formerly with the Studebaker and Cadillac agencies in New York.

The Marquis de la Falaise de la Coudraye has taken the California territory and it is expected that other agencies will be started in the East, but the company intends to expand slowly.

Michigan to Fight Insurance

DETROIT, April 12—Michigan automotive men are aligning their forces to oppose a compulsory insurance bill which has just been introduced before the Michigan Legislature. The bill is similar in many respects to proposed acts which have been presented to the Legislatures of many states during the winter.

Rickenbacker Bids Rejected by Court

DETROIT, April 14—Bids received at the sale of the Rickenbacker Motor Co. were not high enough to satisfy the court and the sale was postponed for one week to April 21. The bids presented were from several groups represented as interested in liquidating the property. The highest bid for the plant and equipment, parts stock and receivables was \$1,050,000, while the highest bid for the personal property was \$495,000.

White Names Brumbaugh Head of Quality Division

CLEVELAND, April 13—A. K. Brumbaugh has resigned as electrical engineer of the Autocar Co. to join the White Motor Co. Mr. Brumbaugh will have charge of the division which has to do with establishment and maintenance of White standards of quality and performance both at the Cleveland factory and in direct branches. His activities cover light delivery express and heavy duty truck chassis as well as the three bus chassis and the specialized truck chassis.

After serving in various engineering capacities, Mr. Brumbaugh joined the industry in 1915 as assistant engineer in charge of experimental work at Autocar. From 1921 to 1926 he developed a line of electric trucks for Autocar and his duties were broadened to cover sales and service as well as engineering. He resumed the duties of experimental engineer when Autocar discontinued electric. He has been very active in the affairs of the Society of Automotive Engineers.

Johnson Output at Peak

NEW CASTLE, PA., April 12—P. J. Flaherty, president of the Johnson Bronze Co., reports production at the plant here at the highest point in its history with further gains indicated for the near future. Demand from the automotive field is reported unusually good.

Multibestos Moves Office

DETROIT, April 12—Offices here of the Multibestos Co. have been moved to the General Motors Building with T. J. Daley, secretary; A. M. Yocom, chief engineer, and W. W. Rogers, comprising the Detroit organization.

N.A.C.C. Conference Gets Traffic Views

Experts Show How Cities Benefit by Traffic Surveys and Correct Planning

CHICAGO, April 13—The two-day city traffic conference of the National Automobile Chamber of Commerce in cooperation with city mayors and traffic experts opened here today with Edward S. Jordan, president of Jordan Motor Car Co., presiding.

The speakers at today's session were Miller McClintock, director of the Albert Russell Erskine Bureau of Street Traffic Research, who recently completed a comprehensive traffic survey for the city of Chicago; E. J. McIlrath, of the Chicago surface lines; J. Rowland Bibbins, consulting engineer, Washington, D. C., and Eugene S. Taylor, manager of the Chicago Plan Commission.

Mr. McClintock discussed the methods of making traffic surveys and the ways that cities can benefit from such surveys; Mr. McIlrath discussed traffic control by signal systems; Mr. Bibbins pointed out the importance of including traffic requirements of the future in the development of a city plan, and Mr. Taylor told how a city plan should be worked out. The afternoon session was presided over by P. L. Emerson of the Yellow Truck & Coach Mfg. Co.

The presiding officer for Thursday's session was Alvan Macauley of the Packard Motor Car Co. and the subjects of discussion included parking problems and enforcement of traffic rules.

1000 Attend K. C. Meeting

KANSAS CITY, April 12—The Central State Safety Congress, the first regional safety congress to be held in the United States, opened here Wednesday with more than 1000 delegates from 15 states in attendance. Governor Ben S. Paulen, of Kansas, and Walter G. King, of New York, president of the National Safety Congress, were on the opening program.

Progressive Light Plan Found Best Traffic Aid

CHICAGO, April 13—Automobile traffic problems in Chicago were discussed last night at the meeting of the Chicago section of the Society of Automotive Engineers by Carroll E. Robb, of the National Safety Council, and Harvey Wood, director of safety for the Yellow Cab Co.

Mr. Robb discussed two of the traffic control signal systems in use in Chicago, the one on Michigan Boulevard, being a synchronized system in which the "stop" and "go" lights show simultaneously at all intersections, and the other being the Loop system in which the "stop" and "go" lights show progressively so as to permit the contin-

uous passage of automobiles whose speed is regulated to about 10 or 12 miles an hour. He said that studies of these two systems have shown that the synchronized system of Michigan Boulevard has actually slowed up traffic, while the progressive system in the Loop has considerably speeded it up. As a result an effort is now being made to have the Michigan Boulevard system changed over to the progressive type.

Mr. Wood told how the traffic signal system has greatly helped in the safer operation of more than 2600 of the Yellow Cab Co. cabs in service in Chicago.

Overland and Hupp to Use C.C.C. Plan

NEW YORK, April 13—Willys-Overland and Hupp Motor Car Corp. have approved the rate schedules of the Commercial Credit Co. of Baltimore, and affiliated companies, for financing retail sales of the cars manufactured by the two factories, according to Commercial Credit officials.

The arrangements are understood to be non-exclusive and it is the motor car companies' viewpoint that the Commercial Credit rates and plans are fair to dealers and purchasers. The new plan of the finance company is featured by a substantial reserve for dealer losses on repossessions.

G.M. to Sell Executives \$35,000,000 Common Stock

NEW YORK, April 14—Stockholders of General Motors Corp. have been notified of the corporation's intention to purchase \$35,000,000 of its common stock before the end of 1930, the stock to be sold to executives under the Managers' Securities Co. plan. The present plan expires in four years and the corporation proposes then to make an arrangement, similar to the one now in effect, with some of its younger executives.

The stock will be purchased gradually and it is the intention of the corporation to submit the entire plan to stockholders for approval.

White Sales Gain 74.5%

CLEVELAND, April 11—March deliveries of White trucks and buses were larger than in any month since last September, representing an increase of 74.5 per cent over February. Orders on the light duty trucks, prices of which were recently reduced, were 23 per cent higher than in March of 1926.

Studebaker Sets Day Mark

SOUTH BEND, April 12—Studebaker Corp. of America shipped 1070 cars from all plants on March 31, a new high single day's record. For the month of March shipments were 17,238 as against 15,656 the previous high March record made in 1923.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co.

NEW YORK, April 14—The seasonal expansion in industry and trade continues, although unfavorable weather, the coal strike and declining petroleum prices have restricted the volume of business in some localities. Basic industries have reported more substantial progress than the leading branches of trade during the past week. Commodity prices have shown greater firmness, while stock quotations have moved irregularly, with a general upward trend. Money rates continue easy.

BUILDING CONTRACTS

Another industrial record was established in building contracts awarded last month. The value of contracts in 37 states, as reported by the F. W. Dodge Corp., was \$620,738,200, which is 4 per cent larger than the total for March last year and \$9,000,000 above the previous record of August, 1925.

FREIGHT CAR LOADINGS

Railway freight loadings during the week ended March 26 numbered 1,008,888 cars, as compared with 1,006,861 cars in the preceding week and 967,945 cars in the corresponding period last year.

BANK DEBITS

Bank debits to individual accounts reported to the Federal Reserve Board for the week ended April 6 were 13.6 per cent larger than the total for the preceding week and 12.1 per cent above that for the corresponding period last year.

FISHER'S INDEX

Fisher's index of wholesale commodity prices stood at 140.9 last week, as against 140.3 a week earlier and 141.4 four weeks earlier.

FEDERAL RESERVE STATEMENT

Bills and securities held by the Federal Reserve banks declined \$63,400,000 during the week ended April 6, the principal change being a decrease of \$54,100,000 in discounts. Note circulation increased \$16,100,000 and reserves \$700,000, while deposits declined \$62,000,000. The reserve ratio rose from 78.8 to 79.7 per cent.

During the same period, loans of reporting member banks increased \$38,000,000 and net demand deposits \$36,000,000, while investments declined \$33,000,000 and borrowings from the Federal Reserve banks \$45,000,000. Loans to brokers and dealers, secured by stocks and bonds, made by reporting member banks in New York City increased \$37,000,000.

The call loan rate continued to range between 4 and 4½ per cent last week. Time loan and commercial paper rates were unchanged at 4½ to 4¾ per cent and 4 to 4¼ per cent respectively.

Franklin Organizes Distributor System

Will Locate 60 Distributor
Points to Meet Smaller
Dealer Problem

SYRACUSE, April 11—Franklin Automobile Co. is organizing its merchandising system upon distributor basis exclusively, the plan calling for 60 distributor points in the United States. Formerly the company marketed its products mainly through dealers with direct connections with the factory and some few distributors.

Under the direction of F. B. Walker, general sales manager, it is planned to make the new system particularly advantageous to the smaller dealer. Forces of factory and distributor district representatives will be organized to visit dealers frequently to discuss problems and suggest means of meeting them. The distributor points will be located within reasonable distances of all smaller dealers so they may have access to the distributor stocks and showrooms in making sales. The necessity of smaller dealers carrying extensive stocks thereby will be eliminated.

The company is also establishing a sales promotion department to aid dealers and distributors in operating under tested selling methods, and with this will have a department of dealership operation and business control. One of the first activities of the sales promotion department will be to make a study of the used car situation and to devise ways of meeting it. An accounting system best suited to Franklin dealer needs will be developed by the department of dealership operation.

The sales promotion department will be under the direction of M. C. Tetley, formerly district representative in New York state. C. G. Cuddy will develop the dealer accounting and control system. In addition to these men the factory sales organization will include Mr. Walker, John W. Lee, Jr., sales manager; Hugh H. Goodhart, advertising manager; F. J. Leyerle, service manager, and C. D. Holmes, traffic manager.

\$995 Convertible Coupe

Added by Dodge Brothers

DETROIT, April 11—A convertible coupe has been added to the Dodge Brothers four-cylinder line. It is fitted with a rumble seat and lists at \$995. Finish of the body is in Armory green lacquer, the black molding being striped with Armory green and cream, while the fenders and splash shields are black. The top is of tan colored waterproof material and a boot is supplied at \$5 additional cost for use when the top is folded. Lowering of the top is accomplished by unclasping two latches at the upper corners of the windshield. Upholstery, including the rumble seat, is of gray Spanish leather. The glass covered instrument panel is finished in green gold.

\$40.81 Per Person Jingling in U. S.

WASHINGTON, April 13—If you've got more than \$40.81 in cash at the present time then you've more than your share, according to figures announced by the Treasury Department showing that as of April 1, there was a total of \$8,584,068,047 cash in the United States and of this sum \$4,757,568,000 was in circulation.

Figured on a population of 116,588,000, the latest available figure, this means that the per capita average of cash is \$40.81, compared with \$41.93 as of March 1.

Durant of Michigan to Determine Plans

DETROIT, April 8—Notices are being sent to stockholders of the Durant Motor Co. of Michigan to meet in the plant offices at Lansing, May 5, to consider plans for exchanging their stock for stock in the Durant Motor Co. of New Jersey. This move is believed part of W. C. Durant's recently announced plan to bring together all his manufacturing operations under Consolidated Motors, Inc. The plan of exchange is said to be beneficial in its aims and ambitions to all concerned.

The Michigan company was organized by W. C. Durant, E. C. Shields, Edward VerLinden and others, and built the large factory at Lansing which has been used as an assembly plant for Star cars. Mr. VerLinden designed and superintended the construction of the plant at Lansing and later became its general manager. Later he left the corporation to head Peerless and disposed of his interests to Mr. Durant. The plant is reported to be producing about 250 cars daily and is gaining on production schedules rapidly. The plant was closed for some time but resumed operations on March 14.

Graham Sales 230 Daily

DETROIT, April 9—Retail deliveries of Graham Brothers trucks and commercial cars now are averaging more than 230 a day. This volume of sales practically equals the high average of 1926, when all previous records of the company were broken with a total of 87,293 commercial car and truck deliveries. Deliveries in the week of April 2 totaled 1277. Deliveries from March 1 to April 2 totaled 5471.

Cleveland Plants Active

CLEVELAND, April 12—Employment in the automotive industry here increased 9.7 per cent in March over February, according to the Chamber of Commerce.

New Rolls-Royce Increased \$2,000

Has Left-Hand Drive, Six-
Brake System and Central
Lubrication

SPRINGFIELD, MASS., April 11—Production by Rolls-Royce of America, Inc., of its "New Phantom" model, an adaptation of the improved car recently introduced by Rolls-Royce, Ltd., in England, and embodying left-hand drive and other changes needed to meet the American trade, is announced as under way at the East Springfield works. The new car is said to give one-third more power and is offered at an increase in price of \$2,000 over the car produced with the "40-50" or "Silver Ghost" chassis, which will continue to be built.

A six-brake system controlled by the servo principle, is one of the outstanding features of the new model. Along with this is a steady flow of power and rapid acceleration of speed made possible by the new reciprocating engine. A third outstanding feature is a central lubrication system, applicable at 35 points in the chassis.

Economy of operation is attained through a patented carburetor of two jets and automatic air valve, while the throttle chamber is heated to assist vaporization. In place of the choke, there is a separate small carburetor to insure easy and sure starting when the engine is cold. A gain in silence of operation also is mentioned as a feature.

Simultaneously with the announcement of the new model comes the publication of the annual report to the stockholders, with statement by President Fuller. These show net earnings for 1926 of \$737,885, against \$739,502 for 1925. Net profit after bond interest and Federal taxes are given as \$524,635, this being equal to \$14.98 a share on the 35,000 shares of preferred stock outstanding. The deficit on Dec. 31, 1925, of \$238,354.12 having been wiped out, a dividend of \$1.75 a share was declared, Nov. 1, 1926, and this has been continued. Dividends had been unpaid since August, 1921.

Marmon Adds Brougham

INDIANAPOLIS, April 11—Marmon Motor Car Co. has added a four-door brougham at \$1,895 to its eight-cylinder line. The new model will be available in a number of color options, with interior fittings and upholstery the same as in other standard closed models. This increases the number of eight-cylinder models to 11, four of which are custom-built.

Daily production at the Marmon factories continues to hold above 100 cars daily with an increase contemplated to meet increasing demand from the entire sales organization. The company reports the addition of nearly 300 distributors and dealers since Jan. 1.

Canada Considers Tariff Drawbacks

Reopening of Important Plants to Hinge Upon Decisions Now Being Sought

OTTAWA, April 9—Certain interpretations of the customs tariff affecting automobile parts may be made in the near future, stated W. D. Euler, minister of customs in the House of Commons this week. The matter arose when a press despatch from Ottawa was read containing an announcement by E. G. Odette (Liberal, Essex East) that he had finally succeeded in having modified, certain tariff provisions which stood in the way of reopening the Canadian Products, Ltd., a branch of General Motors of Canada, Ltd.

The article forecast the remodelling of the company's plant as a result of the modifications in the tariff. H. H. Stevens asked if such tariff changes had been made, and if they had been made by order-in-council. The Minister of National Revenue replied that no such order-in-council had been passed. The article probably referred to to an interpretation of the act of last year, he said, whereby certain drawbacks of duty were permitted when the products were of 40 or 50 per cent Canadian content. It was a matter of departmental interpretation.

The question was whether each model of each car or all models of certain makes of cars or the entire product of certain factories should enjoy the drawback because of the percentage of Canadian content. "It may be that certain interpretations may be made" said the minister.

Rumania to Lower Duty

WASHINGTON, April 9—A general revision of the Rumanian import tariff is expected to become effective soon, the U. S. Department of Commerce announced here this week. The changes will affect automobiles and motorcycles. The rate on automobiles weighing 1000 kilos or less will be reduced from 810 to 560 lei on automobiles weighing from 1000 to 1500 kilos the rate will be increased from 900 to 960 lei, and on cars weighing more than 1500 kilos the rate is increased from 900 to 1600 lei. On automobile spare parts the rate is decreased from 1500 to 750 lei on the unfinished parts and increased from 2430 to 2500 lei on finished parts. The motorcycle rate is increased from 1605 to 2000 lei.

Sweden May Increase Duty

WASHINGTON, April 14—A motion has been placed before the Swedish Parliament to increase the import duty on automobiles from 15 to 30 per cent ad valorem in order to aid the development of the domestic industry, the U. S. Department of Commerce was informed this week by its minister at Stockholm.

Designs Freight Cars for Automotive Parts

MILWAUKEE, April 11—The first of 500 new freight cars designed especially for the transportation of heavy automotive parts and materials by the Chicago, Milwaukee, St. Paul & Pacific, were placed in service in Milwaukee during the past week. The new cars are of record capacity so far as rolling stock for regular shipments is concerned. The load limit is 112,300 lb. They have additional width over the previous standard cars, being 9 ft. 2 in. wide. They are 50 ft. 6 in. long and 10 ft. inside clearance height.

Rim Output Falls Below 1926 Totals

CLEVELAND, April 11—The Tire & Rim Association of America, Inc., reports a decided decrease in rim production in the United States for the first three months of 1927 as compared with the first three months one year ago. During the first quarter of 1927 there were 1,305,962 fewer rims made than during the same period one year ago, the figures being 5,314,142 for 1927 as against 6,620,104.

During March rim production fell off 399,411 as compared with one year ago, the figures being March, 1927, 2,071,989; March, 1926, 2,471,400.

Production during March of this year, in principal sizes, follows:

	Clincher March, 1927	March, 1926
30 x 3½	59,281	415,880
Balloon		
28 x 3½	648,568	921,659
28 x 4	285,396	267,292
29 x 4	316,012	322,247
30 x 4½	157,382	178,028
30 x 5	22,778	30,506
31 x 5	16,635	35,913
High Press.		
30 x 3½	13,045	13,197
32 x 4	14,473	13,879
32 x 4½	21,275	36,821
Truck "20"		
30 x 5	153,905	69,328
Truck "24"		
34 x 5	3,142	2,831
36 x 6	3,822	7,642

Cadillac Has Best Month

DETROIT, April 9—According to L. P. Fisher, president of Cadillac Motor Car Co., sales to dealers in March established a monthly record. March shipments of Cadillac and LaSalle cars exceeded by 29 per cent March, 1926, which was the best previous month. The increase, he said, was partly due to introduction of the LaSalle and partly to increased Cadillac sales throughout the country. Mr. Fisher predicts April business will exceed March.

Committee to Advise on Tax Reductions

Congress to Hear Representatives of Industry in Preparing New Program

WASHINGTON, April 14—The formation of an advisory tax committee, comprising representatives of legal, economic and industrial groups, which will consider ways and means of tax reduction for the next Congress, was decided upon here this week following a three-day meeting of an invited group of representatives conferring with members of the joint committee on internal revenue taxation, headed by Representative Green of Iowa.

The automobile industry did not have a direct representative at the meeting but was represented as a member of the United States Chamber of Commerce by John J. O'Connor and Blaine F. Moore. All meetings of the conferees were executive. Following the sessions, it was stated by Chairman Green that the purpose of the meeting was to formulate plans by which the public and business interests generally could best cooperate with the joint committee on taxation.

There will be a joint meeting at a later date between the joint committee, the House and Senate ways and means committees and representatives of the industry, at which time individual consideration for tax reductions will be considered and it is expected that at this meeting, the date of which will be announced later, the automobile industry will be heard as to repeal of the 3 per cent tax on passenger cars.

France Halves Tax on 9-Year-Old Cars

PARIS, March 30 (by mail)—Taxation on automobiles nine years old and more will be cut in half from next month, according to a law just put into effect in France. This will benefit an important number of American army trucks, such as Pierce-Arrow, Liberty, and others which have been taken care of by their makers, or by firms having bought up spare parts and featured on service. Most of the American army trucks and cars have gone out of existence, but the Pierce-Arrow company states that it has records of 1000 trucks built prior to 1918 and still in regular civilian service in France. In order to get advantage of the 50 per cent cut owners must prove that the automobile left the factory before January, 1918.

Bendix Opens in Detroit

DETROIT, April 11—Bendix Brake Co. has opened branch sales offices in the General Motors Building to permit better serving of their customers' interests in the Detroit territory.

Men of the Industry and What They Are Doing

Blackburn is Appointed Oakland Works Manager

L. A. Blackburn has been appointed works manager of Oakland Motor Car Co. He joined the automotive industry after the war as plant engineer for the Saginaw Products Co. and a year later was made plant engineer at the Olds Motor Works. He remained with Olds for three years. Mr. Blackburn later became vice-president in charge of industrial engineering with Allen J. Saville, Inc., Richmond, Va., where he remained until joining the Oakland organization.

Owen Joins Metalcraft

W. G. Owen, formerly with the Elgin Clock Co., has been appointed production manager of the vanity case division of the Grand Rapids Metalcraft Corp. The company has equipped a new plant for the manufacture of leather covered cases on which it expects to reach a volume of 1500 daily by June 1.

Wright Takes Over District

Harold M. Wright, formerly manager of the Detroit branch of the John Warren Watson Co., has returned from a vacation trip and has assumed his duties as special representative to automobile manufacturers. He will cover Illinois, Indiana, Wisconsin and Iowa, with headquarters in Chicago.

Young Aids Sales Head

W. T. Young, Jr., has been promoted to assistant general sales director of the Marmon Motor Car Co. For the past year Mr. Young has been sales promotion manager of the company. He is succeeded in this post by Ottis Lucas.

Chapin to Address Convention

Roy D. Chapin, chairman of the board of Hudson Motor Car Co., will address the fourteenth National Foreign Trade Convention in Detroit, May 25 to 27, on "The Motor Influence in Our Foreign Trade."

White Promotes Feltz

Charles F. Feltz has been promoted to sales manager of the St. Louis district of the White Co. He has been with the White company 13 years and has specialized in oil accounts.

U. S. Leads Leipzig Exhibits

NEW YORK, April 11—Ninety per cent of all exhibits at the Leipzig fair this year were American cars. The exhibit clearly demonstrated the fact that American automobiles are well established throughout Germany and more than hold their own in competition with foreign makes.

Dewandre Here to Show Brake

Albert Dewandre, of Liege, Belgium, is in the United States in connection with his vacuum servo brake interests. It is the intention of Mr. Dewandre to spend from six weeks to two months introducing his servo brake to American manufacturers and arranging for its construction and sale under license.

Introduced three years ago, the Dewandre vacuum servo brake has been adopted as standard by about 35 European manufacturers, including 15 in France, 12 in England, 4 in Germany and 1 in Italy. In addition, the manufacturing rights have been taken up in Germany by Bosch Magneto Co., in France by the Repusseau Co., and in England by the Clayton Wagon Co.

Moskovics to Address I. M. A.

F. E. Moskovics, president of Stutz Motor Car Co. of America, Inc., will speak to the Illinois Manufacturers' Association at the Palmer House, Chicago, April 26, on "The Economics of the Motor Car." C. A. Campbell, sales development manager, has returned to the factory after a month's trip visiting dealers in the South and Southwest.

Stone Joins Ternstedt

P. E. Stone has been appointed sales engineer of the Ternstedt Mfg. Co. Previously he had been identified with the Eberhard Mfg. Co., the Pullman Co. and for 10 years he was in charge of construction and design with C. Stone & Sons, Chicago.

Nash on C. & N. W. Board

C. W. Nash, president of Nash Motors Co., has been elected a director of the Chicago & Northwestern Railroad Co.

Ballard Named Director

R. K. Ballard has been elected a director of the Advance Rumely Co., succeeding R. G. Hutchins, of New York.

Raymond E. Clark

PHILADELPHIA, April 11—Raymond E. Clark, widely known in the industry through his connection as advertising representative of the Chilton Class Journal Co. and its predecessor companies, died suddenly in Detroit on a recent trip in that territory. Funeral services were at Morgantown, W. Va.

Davison Inspects Engines at Pratt & Whitney Plant

Flying from Washington to Hartford in a three-engine, eight-passenger army monoplane and arriving at Brainard Field, Hartford, Conn., Acting Secretary of War F. Trubee Davison, assistant secretary of war for aviation, was conveyed to the plant of the Pratt & Whitney Aircraft Co. where he inspected the Wasp and Hornet airplane engines.

Mr. Davison was met at Brainard Field by Governor Trumbull, Major William F. Ladd of the Connecticut National Guard, and President Frederick B. Rentschler of the aircraft company. The secretary said that Congress had already voted the appropriation required for the first year of the air division program and that the Hartford field would be included in the tests to be made during the coming summer.

Biggart Joins J. I. Case

Harry H. Biggart, vice-president in charge of production and director of Emerson-Brantingham Corp., has resigned to become an executive officer of the J. I. Case Threshing Machine Co. Mr. Biggart before his association with the Emerson-Brantingham concern and the Osborne line was vice-president of the International Harvester Co., Hamilton, Ont.

Federal Names Export Men

E. H. Burford has been placed in charge of Federal Motor Truck Co. sales in Continental Europe, and Enrique Wulff named manager in South America. Mr. Burford has long been identified with successful motor truck operation in the British Isles, and Mr. Wulff has been connected for a long period with the branches of W. R. Grace & Co. in Argentina and in Cuba.

Spencer New York Manager

F. A. Spencer has been appointed manager of the Olds Motor Works branch in New York. He has been connected with General Motors Corp. in executive positions for eight years, being first identified with the export division and latterly with Chevrolet.

Rupp Heads White Personnel

Nelson Rupp has been appointed personnel director of the White Motor Co. at the Cleveland factory. He was formerly in charge of personnel for John Morrell & Co., packer, of Ottumwa, Iowa.

Marshall With Piston Ring

H. W. Marshall has joined the sales organization of the American Hammered Piston Ring Co. Mr. Marshall was formerly with the Anderson Co. of Gary, Ind.

G.M. March Sales Increase to 146,275

Total Eclipses Former Record
for Single Month—Quarter
Sales 329,310

NEW YORK, April 11—General Motors Corp. retail sales established a new high record in March with 146,275 cars against 141,651 in May, 1926, the previous record month. The corporation's sales to dealers in March also made a new high, with 161,910 units compared with the previous record of 138,360 in September last year.

The total for the first three months also was a new high mark for General Motors. Comparisons follow:

Dealers' Sales to Users			
	1927	1926	1925
Jan.	81,010	53,698	25,593
Feb.	102,025	64,971	39,579
March	146,275	106,051	70,594
Total	329,310	224,720	135,766
Division Sales to Dealers			
	1927	1926	1925
Jan.	99,367	76,332	30,624
Feb.	124,426	91,313	49,146
March	161,910	113,341	75,527
Total	385,703	280,986	155,315

Chevrolet March Output Reaches 107,900 Total

DETROIT, April 9—A new production record was hung up by the Chevrolet Motor Co., in March, when 107,900 automobiles were built. A new one-day record was also hung up on March 31, when 5075 Chevrolets rolled off the assembly lines. The month's production exceeded that of March, 1926, by 42,733, a gain of 65.6 per cent.

Chevrolet production for the first quarter of 1927 totaled 267,393 automobiles, exceeding the first quarter of 1926 by 104,486 cars, a gain of 64.1 per cent.

To bring about this greater production, Chevrolet is now employing 32,142 persons in its various plants, compared with 21,678 a year ago.

Comparative Chevrolet production figures for the first quarter of the last three years follow:

	1927	1926	1925
Jan.	73,676	46,437	18,292
Feb.	85,817	51,303	28,081
March	107,900	65,167	43,495
Total	267,393	162,907	89,868

Store Sales 1.5% Lower

WASHINGTON, April 14.—Retail sales in department stores in the United States during March of this year showed a decline of 1.5 per cent compared with sales in the same 621 department stores in March, 1926, according to retail sales figures just announced by the Federal Reserve Board.

Sales were smaller in seven Federal Reserve Districts, the largest decreases

being in the Minneapolis, St. Louis, Richmond and Philadelphia districts. In the Chicago district there was an increase of about 4 per cent and small increases were also shown in the Boston, New York and Dallas districts. Of the total number of stores reporting, 241 showed larger sales than last year and 380 reported declines, the general average being a decline of 1.5 per cent.

Nash Quarter Net Totals \$3,925,454

KENOSHA, April 12—Nash Motors Co. reported net profit for the first quarter of its 1927 fiscal year, covering the three months ended Feb. 28, as \$3,925,454, which compares with \$4,137,508 for the corresponding quarter of the 1926 fiscal year.

With reference to business conditions President C. W. Nash said: "I see nothing today to cause me to change the opinion expressed at the beginning of 1927 that we would enjoy a year of normal prosperity. I have observed that the buying public seems to be proceeding with a little greater caution in 1927 than was true in 1926, and this is in keeping with the views I publicly stated at the beginning of the current year.

"It might be well to point out that at this season of the year we find that our dealers throughout the country have a much smaller stock of goods on hand than a year ago, and this is another sound reason why we should expect a good business throughout the balance of 1927. I am satisfied that our position is a healthy one and our product never represented a greater value than it does today."

Railway Bus Purchases Increase in 1st Quarter

NEW YORK, April 12—Sales of Mack buses to traction companies and railroads in the first quarter of 1927 were higher than for any similar previous period, Roy Hauer, manager of the general bus department of Mack Trucks, Inc., reports. During the first quarter of 1927, 82 per cent of bus sales of the company were to public utility companies, 32 per cent being gas-electric drive. Officials of the company's bus department consider opportunity for sales in the electric traction field very favorable for the balance of the year.

ACF Sells Wire Wheel

NEW YORK, April 12—The Wire Wheel Corp. of America has purchased the wire wheel business of the American Car & Foundry Co. Under the plan of acquisition a considerable part of the plant equipment now in Detroit will be moved to Buffalo. Current output of wire wheels will be increased 20 to 25 per cent by the purchase, H. G. Jackson, president of the Wire Wheel Corp. estimates.

Financial Notes

Omnibus Corp. reports for the year ended Dec. 31, 1926, consolidated net income of \$805,904 after expenses and interest, equivalent after 8 per cent preferred dividends to 15 cents a share earned on 625,252 no par shares of common stock. This compares with \$793,011, or 14 cents a share, on 595,210 shares in 1925. Fifth Avenue Bus Securities Corp. controlled by the Omnibus Corp. reports for the year ended Dec. 31, 1926, net income of \$380,670 after expenses and taxes, equivalent to 64 cents a share earned on 500,129 no par shares of stock. This compares with \$379,995, or 64 cents a share, in 1925.

Mullins Body Corp. declared regular quarterly dividends of 2 per cent on the preferred, payable May 1, to stock of record April 18. Profit of Mullins Body Corp. for March was \$60,000 after charges but before Federal taxes, and for the quarter ended March 31, 1926, profit was \$150,000 after charges but before Federal taxes, compared with \$107,017 in first quarter of 1926.

Republic Motor Truck Co., Inc., reports for 1926 total assets of \$3,491,925 against \$3,510,406 at the end of 1925, and a surplus of \$485,033 against \$417,556. Current assets were \$2,423,211, of which \$69,503 was in cash, against \$2,205,206, of which \$68,253 was in cash. Current liabilities were \$466,555 against \$371,409; accounts payable, \$252,334, against \$273,365; notes payable, \$100,965, against nil.

Collins & Aikman Co. reports for the 13 months ended Feb. 28, a balance available for dividends on common stock of \$2,904,160. Gross profit for the 13 months' period was \$4,074,199. Dividends of \$758,624 were paid on common stock, leaving a balance of \$2,145,536 for transfer to surplus. The company recently acquired the business of the A. T. Baker Co.

Perry Fay Co., manufacturer of screw machine products for the automotive industry, has resumed dividends and announces a dividend of 50 cents a share to stock of record March 31. The company was organized in 1906 and paid dividends of 6½ to 13 per cent from 1917 to 1926.

Pierce-Arrow Motor Car Co. retired \$250,000 of its 8 per cent notes through sinking fund operation April 1. This makes \$500,000 of original issue so retired and leaves outstanding \$3,700,000.

Fageol Forms Company

KENT, OHIO, April 12—Frank Fageol, former head of the Fageol Motors Co., will be here this week in connection with the promotion of a new bus manufacturing company, which will manufacture a new type bus to be known as the "twin coach." The company has been incorporated under Delaware laws with \$4,000,000 in preferred stock and 400,000 shares of no par value stock. It is expected to take over the Kent plant of the American Car & Foundry Co. at a price said to approximate \$190,000.

Production of the new coach was to start immediately.

Courts Split Views on Car Confiscation

Completely Opposing Decisions to Bring Seizures Again to Supreme Court

NEW YORK, April 11—Two recent court decisions, hitherto unreported, emphasize the confusion existing with respect to the rights of innocent lienors and automobile dealers retaining title under conditional sales contracts in cars seized by the prohibition enforcement officers.

In a case coming before the United States Circuit Court of Appeals for the Second Circuit, Commercial Credit Corp. v. U.S., the driver of a car had been arrested but not convicted. Writing the opinion, Judge Swan held that in such a case Section 26 of the Prohibition Law protected the rights of innocent parties and made it mandatory that forfeitures be made under its provision instead of under the provision of Section 3450 of the Revenue Law, which forfeits the rights of innocent parties.

On the other hand, Judge Kerrigan, writing the opinion for a case coming before the Ninth Circuit, held that where the drivers were charged with both illegal possession and transportation, but were prosecuted for illegal possession, under the decisions of the United States Supreme Court in the Ford coupe case and in the Port Gardner Investment Co. case, the car could be forfeited by the government under Section 3450, and without giving heed to the mandatory provision of Section 26 of the prohibition law, and held that there is no direct conflict between the two statutes. The decision, therefore, is for practical purposes in conflict with the decision in the Second Circuit.

Duane R. Dills of the law firm of Dills & Towsley of New York, attorneys for the Commercial Credit Corp., who argued the case before the Second Circuit and also the cases before the U. S. Supreme Court, is preparing an application for a writ of certiorari in the U. S. Supreme Court from the decision of the Ninth Circuit to try to get the question cleared up by the Supreme Court. The cases are being taken up as test cases in behalf of the various automobile dealers' associations and the finance companies, and he is hopeful that the Supreme Court will permit the cases to be brought before it.

Seized Car Use Held to Seizing Other Cars

WASHINGTON, April 11—Automobiles and trucks confiscated by prohibition agents and forfeited to the United States cannot be used by the government except for enforcement of the customs laws and the national prohibition and narcotics acts, the Comptroller General of the United States ruled.

Coolidge is Offered Judson Summer Home

WASHINGTON, April 11—President Coolidge this week was invited to spend his vacation on the 128-acre estate of R. W. Judson, president of the Continental Motors Corp., at Grand Haven, Mich. The invitation was extended by Rep. Carl Mapes, of Michigan, and was taken under consideration by the President.

Appleton Named Head of Malleable Company

MILWAUKEE, April 11—The Wisconsin Appleton Co., manufacturer of malleable castings, has perfected its organization by the election of these officers: President, A. I. Appleton, Chicago; vice-president and plant manager, H. J. Van Beek, Milwaukee; secretary, E. B. Hansen, Milwaukee; treasurer, J. V. Painter, Chicago. The new concern early this year took over the entire plant and business of the Stowell Co., South Milwaukee, one of the oldest malleable foundry concerns in the country.

A. I. Appleton also is head of the Appleton Electric Co., Chicago. Mr. Van Beek formerly was treasurer of the Stowell company, and Mr. Hansen, in charge of the Stowell sales office in Chicago. Mr. Painter is secretary of the Appleton Electric Co.

Australian Bus Growth Brings Regulation Demand

WASHINGTON, April 11—So great has been the growth of motor bus operation in Australia during the past few years that a condition has arisen which will require regulation by the Australian Parliament, according to advices to U. S. Department of Commerce this week. A proposed motor transport law now is being worked out.

There are 520 motor buses operating in Sidney alone, carrying 250,000 passengers a year, while 4000 men are employed operating buses throughout the country.

Sparks Names Counsel

DETROIT, April 9—Brooke, Smith & French, Inc., have been appointed advertising and merchandising counsel of the Sparks-Withington Co. in its program for the expansion of the market for its radio and motor car horns. The trade representation of the company is to be broadened.

Mimax Production Started

MILWAUKEE, April 11—The new lacquer plant of the Patton-Pitcairn works is producing 8000 gal. of lacquer daily. The product is trademarked "Mimax" and it has been adopted by a number of large automotive concerns, both in Milwaukee and other centers.

Report Rubber Pool Holds 30,000 Tons

Will Not Make Further Purchases Unless Present Prices Show Recession

AKRON, April 11—Some 15,000 tons of crude rubber have been stored in this country by the so-called Rubber Pool, it is estimated by rubber dealers. In addition, it is reported that the pool has between 10,000 and 15,000 tons of rubber stored in London.

The report of the Rubber Association of America, Inc., reveals that stocks on hand in this country as of Feb. 28, 1927, were 14,915 tons greater than at the end of January, despite the fact that consumption in February was 2727 tons in excess of exports. It is assumed that these 15,000 tons of rubber represent rubber stored by the pool and not previously reported.

Since the formation of the pool the price of rubber has continued firm. The pool will not acquire additional rubber, it is believed, unless there is a recession from the present price of around 40 and 41 cents a pound. Present holdings will not be disposed of, in the opinion of observers, at a price less than 50 cents a pound.

Tire Production Holds Close to First Quarter

AKRON, April 11—While it is doubtful that April tire production will equal that of March, there has been only a slight let-down in factory operations. A substantial increase in sales to distributors and dealers was noted by the rubber companies during the first two weeks in April. Shipments of tires to car manufacturers for original equipment are reported heavy and will increase during the month.

P. W. Litchfield, president of Good-year Tire & Rubber Co., announces that sales and production during the first three months were the greatest in the history of the company. The three plants in Akron, Canada and California produced 4,030,656 casings. Sales totaled 4,101,457, representing an inventory reduction of more than 70,000. March production was 1,500,000 casings and 1,700,000 tubes.

Officials of Miller Rubber Co. have reported a 100 per cent gain in sales for the first quarter over the corresponding period a year ago. J. M. Alderfer, president of the India Tire & Rubber Co., states that his company experienced a 150 per cent increase in sales in the first quarter over the same period last year.

Peerless Adds Roadsters

CLEVELAND, April 11—Peerless Motor Car Corp. has introduced a two to four-passenger roadster at \$1,295, and a two to four-passenger coupe roadster at \$1,345 on its 6-60 chassis.

Sales Hold Firm in Many Centers

Unemployment Lowers Detroit Totals—Cleveland and Spo- kane Find Business Better

DETROIT, April 9—According to the monthly report of the Detroit Automobile Dealers Association, new car sales in Wayne county are not keeping up with a year ago, in contrast to reports from other state points to the effect that business is nearly as good as in 1926. It is believed, however, that the cause for this is the fact that there are some 44,000 fewer men employed in Detroit compared with a year ago.

March was the best month for the first quarter, with 5940 new cars sold in Wayne county, bringing the total for the quarter up to 12,296 compared with 16,213 last year.

Cleveland Total Cut by Ford

CLEVELAND, April 9—Reports on automotive business from Cleveland dealers and manufacturers indicate the conservative forecast made at the beginning of 1927, predicting lower sales marks, are a bit out of line. There were filed in March 3049 bills of sale for new cars at the county clerk's office. This is in comparison with 3565 bills of sale filed during the corresponding period in 1926.

Ford dealers sold 1169 cars in March, 1926, against 433 cars in March, 1927. The difference indicated more than makes up the margin of decrease outlined in the total report. Used car sales continue to climb. In March, 1926, 10,469 used cars were sold. In March, 1927, 11,151 cars were sold.

Spokane Sales Increase

SPOKANE, WASH., April 9—New car sales as reflected in Spokane county registrations for March took a decided spurt, the total being 571 compared with 344 for the two months preceding. The increase is due solely to weather conditions. With the most favorable crop conditions in years, the outlook for an exceptionally strong year in the automotive field is encouraging.

Chevrolet led registrations with 119, Ford being second with 108 and for the three months' period Chevrolet had 198 and Ford 173. Other March registrations included: Buick, 32; Chrysler, 36; Dodge, 27; Hudson-Essex, 42; Nash, 25; Willys-Knight-Overland, 40; Studebaker, 24 (including Erskine); Star 27.

South Dakota Trucks Gain

PIERRE, S. D., April 9—Although passenger car registrations in South Dakota have declined in the first quarter of the current year in comparison to the 1926 report for the period, increase in truck registrations has offset this falling off. Financial conditions of the state were blamed for the falling

Special Taxes Increase 16% in 1926

While Registrations Show Gain of 10%

WASHINGTON, April 12—Special taxes on motor vehicles in the United States are increasing at a greater rate than the increase in registrations, it was announced here this week by the American Automobile Association.

Research by the association shows that during 1926 while the registrations of motor vehicles in the 48 states and the District of Columbia increased 10 per cent, special taxes, exclusive of the personal property tax, collected from motor vehicle owners mounted 16 per cent.

The average per vehicle tax levy for the entire country was \$21.60 in 1926, as compared with \$20 in 1925, an increase of 8 per cent. The per vehicle tax has increased 153 per cent since 1919, when it was \$8.55.

Special taxes collected from car owners by the states reached a new high peak last year, with a total of \$475,885,583, as compared with \$408,877,708 in 1925, an increase of \$67,007,875.

The state revenues from the gasoline tax increased 27 per cent in 1926, from \$148,258,087, in 1925, to \$187,603,231.

off of passenger car registrations, which this quarter total 117,685 with 11,150 trucks as against 118,020 passenger cars and 10,726 trucks in the first quarter of 1926.

Gasoline Tax Increases Raise Yield \$38,000,000

NEW YORK, April 11—As the result of increases in gasoline tax rates already made by several states and in prospect in others, it is estimated that total revenue from this source in the United States next year will be at least \$225,000,000, against \$187,000,000 last year.

New Jersey recently established a two-cent tax, Illinois, New York and Massachusetts now being the only states without gasoline taxes. In the legislative season so far, Alabama has increased its rate to four cents, from two cents; Arkansas to five cents from four cents; Idaho to four cents from three cents; New Mexico to five cents from three cents; Tennessee to four cents from three cents; Texas to three cents from one cent; Wyoming to three cents from two and one-half cents, and Pennsylvania to three cents from two cents.

More than 20 state Legislatures are still in session and further increases may be made.

Texas Has 264 Truck Lines

AUSTIN, TEXAS, April 9—In a report on motor truck transportation in Texas just made to Governor Dan Moody by the railroad commission it is stated that there is a total of 264 motor truck lines operating in this state. Of this number, 64.38 per cent are operating 40 miles and less between cities: 74.22 per cent 50 miles and less; 79.35, 60 miles and less, and 85.59, 75 miles and less.

It is declared that the rates used are varied and unstable. Many are made on the spot under competitive bidding, it is asserted.

White Starts Work on 1927 Expansion

CLEVELAND, April 9—Expansion of the White Co. branch sales and service organization during 1927 includes a new building just completed in Milwaukee, the beginning of work on new buildings in Los Angeles and New York, plans for construction in Syracuse, Providence, and Hartford, and quarters either new or enlarged in eight other cities.

The largest developments are in Los Angeles and in Bronx Borough, New York City. The Los Angeles branch building, which will cost \$500,000, will be one story and basement, will have 132,000 sq. ft. Construction begins the middle of April.

Work starts at the same time on the Bronx building, which will be the third White factory branch in New York City. The building, to cost \$250,000, will be two stories and basement, with 90,000 sq. ft. of floor space.

The Fresno, Cal., branch recently moved into a new building erected for the White company. The Shreveport, La., branch, established this year, also occupies a new building constructed for White, while another newly established branch has leased quarters in Amarillo.

Additional space was obtained for the Spokane branch as well as the Oakland, Cal., branch, and greater facilities were provided by the installation of additional equipment at the Winnipeg branch. New locations, with more space, have been occupied at Toledo and San Diego.

Gets M A N Diesel Rights

PHILADELPHIA, April 9—According to reports in German papers, the American Brown-Boveri Electric Co. has acquired a license from the Maschinen-fabrik Augsburg-Nurnberg for the manufacture in America of the M A N Diesel engines for rail cars developed by the German company.

Stevens Offers Cup for Stock Car Test

Requires Speed of 60 Miles
an Hour for 24 Hours—
Stutz Files Entry

INDIANAPOLIS, April 11—Stutz Motor Car Co. of America, Inc., will be the first to compete for the new Stevens Trophy, which is offered to any manufacturer successful in a 24-hour stock car test on the Indianapolis Speedway. The requirements of the test call for the completion of a 24-hour run at an average of 60 miles an hour or better in a regular production closed car.

It is provided that each test be held under the direct supervision of a board of three engineers, members of the Society of Automotive Engineers, to be selected by the Indianapolis Motor Speedway. The cars must be of stock chassis of which at least 1000 have been built, and equipped with standard closed body of which at least 10 have been sold at a regular established price.

The fuels used in the test will be standard gasoline purchased by the technical board. An auxiliary system of gas supply will be permitted, as will any gear ratio and either exhaust cut-out used or muffler disconnected, as deviations from strict standard equipment requirements.

The donor of the trophy is Samuel B. Stevens, who is remembered in the industry for his activity in the early racing days. His Mercedes 60, and later a Mercedes 90, were entered in the early speed trials at Ormond Beach and in the Vanderbilt Cup contests of 1904 and 1905. His Darraq won the Vanderbilt race of 1906. Besides being a member of the S. A. E. he is a former member of the contest board of the American Automobile Association.

The purpose of the trophy, he said, is to give manufacturers an opportunity for going on record with authenticated performance "in what I consider to be a real worthwhile test of their stock output. Flash speeds as against sustained speeds mean very little. It is the latter quality that really counts as it means the superlative degree of merit in automobile design and construction."

Stutz will start three cars in the test on April 21, F. E. Moskovics said, a standard sedan with a regular composite body, a car equipped with a Weymann closed body, and a Black Hawk type of touring car, the latter acting as a pace maker. The test will give Stutz an opportunity to compare the performance of the regular composite body with the Weymann body. Three well known racing drivers have been retained.

Auburn Sets Stock Mark

LOS ANGELES, April 9—A new 1000-mile stock car record was set up by an Auburn straight-eight in a test run under American Automobile Association auspices at the speedway here.

Navy Buys Packard 24-Cylinder Engine

WASHINGTON, April 14—The U. S. Navy has contracted with the Packard Motor Car Co. for one Packard type 1A 2775 experimental engine, 24-cylinder, developing 1200 hp. at 2700 r.p.m., it was announced here this week. The contract cost is \$31,700.

The average of 68.37 miles an hour exceeded the former mark by $8\frac{1}{2}$ miles an hour.

Studebaker Sets Records in 5000 Mile Test Run

LOS ANGELES, April 12—A Studebaker Commander model covered 5000 miles in 4909 minutes, an average of 61.12 miles an hour, in a test made at Culver City under auspices of the contest board of the American Automobile Association. In establishing the record the Studebaker model is credited with four other American stock car records—2500 miles were run in 40 hours, 12 minutes and 54 seconds, an average of 62.16 miles per hour; 3102½ miles were covered in 50 elapsed hours, an average of 62.05 miles an hour; 3500 miles were covered in 56 hours, 47 minutes, 32½ seconds, and 4414 miles were run in 72 elapsed hours. The total elapsed time included time for stopping for fuel, relief of drivers, etc. Replacements included one tire, one grease cup and two chassis lubrication cups. Harry Hartz started and finished the run.

Falcon Output 70 Daily, Plans Increase to 100

DETROIT, April 12—Falcon Motors Corp. has stepped up production from 50 to 70 cars a day, according to President John A. Nichols, Jr., who also declares that by May 1 the company will be producing 100 cars a day.

Investigates Air Contract.

WASHINGTON, April 13—Investigation of the circumstances surrounding the awarding of a contract for carrying the New York-Chicago air mail to the National Air Transport, Inc., is being made this week by the Comptroller General. Request for the investigation was made by the North American Airways, Inc., of Cleveland, an unsuccessful bidder.

Rubber Imports Lower

NEW YORK, April 11—Importations of crude rubber into the United States totaled 35,078 tons in March against 42,677 tons in the corresponding month of 1926, according to the report of the Rubber Association of America, Inc. The total for the quarter ended March 31 was 108,639 against 115,441 for the first quarter of 1926.

Parker Aircraft Gets Factory Site

Will Build Commercial and
Pleasure Plane Types at
Cleveland Airport

CLEVELAND, April 9—Airplanes will be manufactured at Brook Park this summer. A new factory will be erected at the city airport where commercial and pleasure planes will be built. The Williard Parker Aircraft Co., headed by Lieut. Williard Parker, who was with American and Canadian air services during the war, will begin erection of the factory within a few weeks. The hangar, to cost \$25,000, will be located south of the big Ford hangar at the east end of the field. It will shelter 12 planes.

The Parker company will manufacture a commercial type of plane to be called the Panther and a light pleasure plane called the Pup.

Mr. Parker is president of the new company, F. Alvin Jones is vice-president, and H. E. Elliot, secretary and treasurer.

The Aircraft Co., newly incorporated with \$75,000 capital, will also construct a general commercial aerial service and will have the agency for the Travelair plane manufactured in Wichita, Kan.

Philadelphia S.A.E. Hears Traffic Relief Proposals

PHILADELPHIA, April 13—Speakers at the meeting of the Pennsylvania Section, S.A.E., this week emphasized the importance to the automotive industry of finding solutions for the ever growing traffic congestion if sales of new cars are not to meet with more resistance than now apparent.

Harold M. Lewis, of the Regional Plan of New York and Its Environs, suggested more extensive use of the "wave" or "platoon" system of traffic control, unloading spaces within building lines in congested districts, segregation of traffic, community "cell" developments to be bypassed by main traffic arteries, and at least partial elimination of important grade and sidewalk crossings.

Samuel P. Wetherill, president of the Regional Planning Federation of the Philadelphia Tri-State District, outlined plans which are being laid for the improvement of conditions about this area.

Norman G. Shidle, editor of *Automotive Industries*, has been named for section chairman for the next year in place of A. K. Brumbaugh, recently nominated, who is leaving the district.

Huff Takes New Name

PHILADELPHIA, April 12—Huff Daland Airplanes, Inc., Bristol, has changed its corporate name to Keystone Aircraft Corp., the business to be conducted without any other change.

Steel Orders Below Rate of Shipments

Fair Sized Volume for May
Shipment Reported—Prices
Continue Steady

NEW YORK, April 14—Steel shipments to automotive consumers run heavier than do fresh orders but there is quite a fair sized volume of new business for early May shipment being booked. Full-finished automobile sheets rule firm at unchanged price levels but the market for black sheets occasionally receives a jolt.

The sheet-bar market is easy at \$34, Pittsburgh or Youngstown, with non-integrated rollers well covered over the current quarter. Semi-finished material for strip mills is quoted at between \$33.50 and \$34. Cold-rolled strips continue to be quoted at 3 cents, Pittsburgh or Cleveland, but new automotive business is rather slow, consumers having considerable material due them on previously placed orders. Similar conditions prevail in the market for hot-rolled strip, with competition among rollers for whatever business is in sight extremely keen.

Cold-finished steel bars are slightly less active than at the beginning of the month, with round lots quoted at 2.35 cents, Pittsburgh or Cleveland. Automotive alloy steels reflect somewhat more competitive conditions among producers, quotations being subject to moderate concessions on attractive orders. Demand for bolts and nuts is fair, with the new price schedule generally maintained.

Pig Iron—The market is a shade firmer, with the Michigan quotation for No. 2 foundry \$19.50. Some sellers in other markets have advanced their prices 25 cents per ton. Automotive foundry owners appear to be satisfied to let the market develop its own course and they are little disposed to anticipate the future.

Aluminum—Automotive demand for foundry metal continues good. The sole domestic producer of virgin metal is believed to be operating at a somewhat higher rate than earlier in the year. Demand for aluminum sheets is a limited affair. Odd lots of ingots move freely in the outside market at a fraction under the leading interest's quotation.

Copper—The long-promised buying wave in the copper market has failed to materialize. In fact producers have considerable trouble maintaining prices on transactions closed. Both Michigan and Connecticut Valley manufacturers of automotive brasses are fairly busy.

Tin—For every pound of 70-cent tin bought by consumers a hundred change hands between dealers. Users are buying only what they can not do without.

Lead—Because orders from the storage battery industry are few and far between, some lead producers believe that a good deal of secondary metal is being used by battery manufacturers. The market continues easy.

Zinc—Stocks on April 1 were about 9 per cent higher than on March 1. The market is easy.

Lighting Device Flashes Car Speed

WASHINGTON, April 14—An automatic lighting device which registers the speed of an automobile by flashing vari-colored lights has been patented by Samuel Shzorowitz, noted German engineer, it was reported this week to the U. S. Department of Commerce.

The device, displayed on the front of the car for the benefit of policemen and pedestrians, consists of a dozen standard lights arranged as a radiator ornament, a different colored light flashing for each increase of 10 miles in the speed of the car from 15 to 60 miles an hour. Efforts are being made to have installations of the device made obligatory.

Hardwood Business Improves in April

ATLANTA, April 12—Hardwood sales to the automotive industry have been showing a marked tendency toward improvement since the first of the present month, following a period of dullness during the last half of February and through March. Motor truck and commercial body makers are the best buyers at present. All branches of the industry are beginning to anticipate their requirements further in advance, but are not yet buying as far ahead as they were a year ago.

With the exception of sales to the truck and commercial body makers, hardwood sales were appreciably less during the first quarter of 1927 than they were during the first quarter of 1926, but if the business continues to improve as it has the last 10 days the second quarter will be fully equal to that of last year.

In spite of the lack of buying, prices have shown no appreciable declines, and as a whole appear to be stable.

Wilson Body Progresses

MOLINE, ILL., April 9—Reorganization of the E. H. Wilson Mfg. Co., maker of automobile bodies, is well under way and it is expected that the concern will be relieved of its receivership by June 1, L. L. Harr, receiver, announced this week. With orders amounting to \$2,500,000 on hand, and the plant showing a profitable operating income the last month, production is now progressing at the rate of two carloads of bodies a day.

Bunting Opens N. Y. Office

NEW YORK, April 11—Eastern and export offices and stockroom of the Bunting Brass & Bronze Co., Toledo, are at 276 Lafayette St., New York.

Tire Inventories Gain in February

Shipments Increase Over February Last Year But Production Rate is Higher

NEW YORK, April 12—Although shipments of casings and tubes from the factories in February were well above the level of the same month a year ago, production was in excess of shipments and resulted in an increase of inventories, according to the figures of the Rubber Association of America, Inc. Comparisons follow:

Comparisons Follow:				
Pneumatic Casings—All Types				
	Inventory	Production	Shipments	
Feb. 1926	8,372,831	3,648,972	2,577,116	
Jan. 1927	7,824,045	3,723,890	3,699,122	
Feb. 1927	8,281,317	3,821,978	3,344,071	
Inner Tubes—All Types				
Feb. 1926	12,817,588	5,118,661	2,801,968	
Jan. 1927	11,688,871	4,002,566	4,512,273	
Feb. 1927	12,056,747	4,244,233	3,840,194	
Balloon Casings				
Feb. 1926	2,487,498	1,598,246	1,285,999	
Jan. 1927	3,119,263	1,793,778	1,794,623	
Feb. 1927	3,244,752	2,017,711	1,886,975	
Balloon Inner Tubes				
Feb. 1926	2,850,865	1,801,922	1,233,663	
Jan. 1927	3,977,723	1,840,966	1,965,152	
Feb. 1927	4,200,796	2,251,634	2,012,852	
High Pressure Cord Casings				
Feb. 1926	4,907,181	1,796,189	1,187,990	
Jan. 1927	4,067,010	1,785,904	1,744,469	
Feb. 1927	4,376,726	1,696,973	1,377,080	
High Pressure Inner Tubes				
Feb. 1926	9,966,723	3,316,739	1,568,305	
Jan. 1927	7,711,148	2,161,600	2,547,121	
Feb. 1927	7,855,951	1,992,539	1,827,342	

Diana Prices Reduced

ST. LOUIS, April 11—Substantial price reductions on Diana models have been made effective by Moon Motor Car Co. The body styles affected and the new and old prices follow:

	New Price	Old Price
5-pass. phaeton	\$1,595	\$1,775
5-pass. roadster	1,645	1,795
De luxe brougham..	1,695	1,995
Palm Beach roadster	1,795	1,995
Cabriolet roadster ..	1,995	2,095
De luxe sedan	1,995	2,195

Organize Felt Products

FLINT, April 11—Organization of Superior Felt Products, Inc., to manufacture felt for use in automobile chassis and bodies, has been completed here. Officers of the company are Fred J. Weiss, president; Ray W. Springer, vice-president and general manager; J. Curtis Willson, secretary, and Spencer Bishop, treasurer. Directors are W. E. Fellows, S. S. Stewart and Reinhardt Kleinpell.

U.S. Alloy to Add Unit

CANTON, OHIO, April 12—Announcement is made by officials of the United Alloy Steel Corp. that a new mill unit to cost approximately \$850,000, will be erected at the east end plant within the near future.

Noted Speakers on Advertising Program

DETROIT, April 8—Many topics of interest to the automotive industry, covering the advertising problems of the day, will be taken up at the Detroit meeting of the Association of National Advertisers which will be held in Hotel Statler, May 9, 10 and 11. Of the 300 national advertisers who are expected to attend, many will be representative of the automotive industry, the committee states. Gordon Kingsbury has been general chairman, and Verne Burnett, secretary of the advertising committee, General Motors Corp., is chairman of the program committee.

According to the tentative program the following men known in the automotive industry will appear as speakers:

W. S. Lockwood, advertising manager, Johns-Manville Co.; Verne Burnett, secretary, advertising committee, General Motors Corp., and chairman of the A. N. A. newspaper committee; C. F. Kettering, president, General Motors Research Corp.; T. G. Grinnell, George C. Batten Co.; Prof. J. L. Brum, head of the advertising and journalism department, University of Michigan; O. C. Harn, managing director, Audit Bureau of Circulations; J. C. McQuiston, advertising manager, Westinghouse Electric & Mfg. Co. At the formal banquet which will be held Tuesday evening, Theodore F. MacManus, of MacManus, Inc., Detroit, will appear as the principal speaker.

Republic Opens New Branch

ALMA, MICH., April 9—Republic Motor Truck Co., Inc., has established a direct factory branch in St. Louis, with F. C. Meyer, former Republic distributor in St. Louis, as manager.

Coming Feature Issues of Chilton Class Journal Publications

May 1—Automobile Trade Journal—Annual Big Small Town Market Number.

May 5—Motor Age—Annual Sales and Service Reference Number.

June 4—Automotive Industries—Engineering Number.

June 10—Motor World Wholesale—A.E.A. Summer Meeting Number.

N. J. Fixes Mileage Tax on Interstate Vehicles

TRENTON, April 9—The New Jersey Legislature has passed an act, effective July 1, applicable to all operators engaged in transportation for hire of passengers or property using New Jersey highways in interstate commerce. The act provides a levy of 1½ cents a mile per truck or bus payable monthly to the commissioner of motor vehicles. Operators are also required to file monthly a sworn statement as to the number of miles traversed by each unit over Jersey highways. The revenue derived from the tax will be used for the construction and maintenance of state highways.

Builds Lacquer Plant

CLEVELAND, April 9—A new lacquer plant is now under construction for the Ferbert-Schorndorfer Co. The plant will cost \$50,000 without equipment. It will be used for the manufacture of lacquers for the automobile and metal furniture field.

Fiat 1926 Profit 66,600,000 Lire

TURIN, ITALY, April 9—According to the annual report of the Fabbrica Italiana Automobili Torino (Fiat), the total earnings for the business year 1926 amounted to 66,600,000 lire, and a dividend of 31 lire per share was paid to stockholders. Business conditions were favorable during the first half of the year while inflation still was rampant in Italy, whereas they left much to be desired during the last half.

Total sales for the year amounted to 1,350,000,000 lire. During the first two months of the current year a marked improvement set in and approximately 1000 more cars were sold. The Diesel engine department of the Fiat works is said to be developing very promisingly.

Two of the former members of the board of directors, Signor Gualino and Count Wietinghoff, retired, and were replaced by two representatives of J. P. Morgan & Co. of New York, Signor Fummi and Professor Valetta. The vice-presidency of the concern, formerly held by Signor Gualino, was taken over by the son of the principal stockholder, Eduardo Agnelli.

Enters "Piston Pin Special"

ELGIN, ILL., April 9—The Elgin Machine Works, manufacturer of piston pins, has entered the "Elgin Piston Pin Special" in the Indianapolis race. The Elgin entry is owned and will be driven by Henry Kohlert, St. Charles dirt track racer and car builder. His machine will be equipped with Elgin piston pins. The car is a Miller Special, purchased last season from Tommy Milton, who retired from the racing game.

Calendar of Coming Events

SHOWS

BarcelonaApril 27-May 8
BudapestJune 4-15
ClevelandSept. 19-23
Exposition, Public Auditorium, National Machine Tool Builders' Assn.
ClevelandOct. 3-7
Exhibition, Public Auditorium, American Electric Railway Ass'n.
CologneMay 20-31
International Commercial Transport Exhibition.
LondonOct. 14-22
Olympia Passenger Car Show.
LondonNov. 17-26
Olympia Truck Show.
MelbourneMay
International Motor Show.
New Haven, Conn.Sept. 6-9
Machine Tool Exhibition.
ParisOct. 6-16
Grand Palais.

CONVENTIONS

American Automobile Association, Annual Meeting, Ritz-Carlton Hotel, PhiladelphiaJune 16-17
American Drop Forging Institute, French Lick Springs, Ind.May 17-19
American Electric Railway Association, Public Auditorium, Cleveland.Oct. 3-7
American Gear Manufacturers Association, Annual Meeting, Hayes Hotel, Jackson, Mich.May 12-14
American Society for Steel Treating, Convention Hall, Detroit.Sept. 19-24
American Society of Mechanical Engineers, White Sulphur Springs, W. Va.May 23-26

American Welding Society, Engineering Societies Bldg., New York CityApril 27-29
Associated Automotive Engine Rebuilders, Hotel Winton, ClevelandMay 26-28
Automotive Equipment Association Summer Convention, Multnomah Hotel, Portland, Ore.June 27-July 2
Chamber of Commerce of the United States of America, Washington, May 2-5
National Association of Automobile Show and Association Managers, Drake Hotel, ChicagoJuly 26-27
National Foreign Trade Council, Hotel Statler, DetroitMay 25-27
National Hardware Association, Metal Branch, Hotel Cleveland, ClevelandMay 5-6
National Safety Council, Stevens Hotel, ChicagoSept. 26-30
Overseas Automotive Club, Luncheon Meeting, Hotel Empire, New York CityMay 12
Society of Industrial Engineers, Hotel Stevens, ChicagoMay 25-27
United States Good Roads Association, convention, Savannah, Ga.June 6-11

N. A. C. C.

New York, May 31—Truck Members Meeting.
New York, June 2—Annual Meeting.

S. A. E.

National
Chicago, November—National Transportation and Service Meeting.
Chicago, Dec. 1—Tractor Meeting.

Cleveland and Detroit, Sept. 19-22—Production Meeting.
French Lick Springs, Ind., May 25-28—Summer Meeting.

Sectional

Buffalo, April 25-26—Aviation and Aeronautics—Joint meeting with Aeronautic Division American Society of Mechanical Engineers. Inspection trips.
Dayton, April 21—Recent Developments in Lighter-than-Air Craft—Dr. Karl Arnstein.
Detroit, April 27-28—Reducing Avoidable Waste in Production—Joint meeting with American Management Association.
New York, April 21—Highways and Vehicles—Dr. T. R. Agg and O. T. Kreusser.

RACES

Abilene, TexasJuly 4
Altoona, Pa.June 11
Altoona, Pa.Sept. 5
Atlantic CityMay 7
Atlantic CitySept. 24
Belgian Grand Prix, Spa-FrancorchampsJuly 9-10
British Grand Prix, Brooklands.Oct. 1
Charlotte, N. C.July 11
DetroitSept. 10
French Grand Prix, Monthery.July 3
IndianapolisMay 30
Los AngelesNov. 27
Salem, N. H.June 25
Salem, N. H.Oct. 12
Syracuse, N. Y.Sept. 3
Targa Florio, Sicily.April 24